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PATENTS

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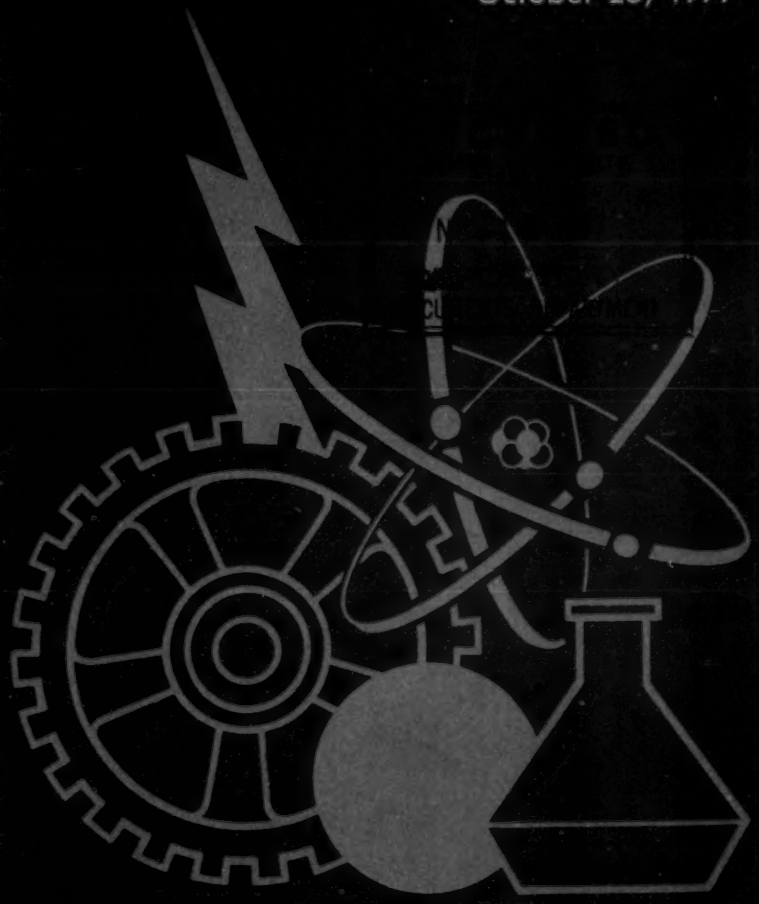

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October 25, 1977 Volume 963 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,802,760, Derick and Frosch, OXIDATION OF SEMICONDUCTIVE SURFACES FOR CONTROLLED DIFFUSION, **filed** July 2, 1976, D.C. Del. (Wilmington), Doc. 76–214, *Western Electric Company* v. *Advanced Memory Systems, Inc.* **Same, filed** July 2, 1976, D.C., N.D. Calif. (San Francisco), Doc. C76–1381–WHO, *Western Electric Company, Incorporated* v. *Micro Power Systems Incorporated.* **Same, filed** July 2, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV76–2122–IH, *Western Electric Company, Inc.* v. *Frontier, Inc.* **Same, filed** July 2, 1976, D.C.N.J. (Newark), Doc. 76–1303, *Western Electric Company Incorporated* v. *Microwave Semiconductor Corporation.* Consent judgment dismissing the action in favor of plaintiff and against defendant, Feb. 10, 1977.

2,841,961, J. E. Lucas, OFF-SHORE DRILLING BARGE, **filed** May 17, 1976, D.C.N.J. (Newark), Doc. 76–903, *DeLong Corporation* v. *Raymond International, Inc.*

2,906,875, E. T. Molinaro, STATION SAMPLING RADIO, **filed** Dec. 20, 1973, D.C. Del. (Wilmington), Doc. 4780, *Anthony P. Catanzaro* v. *International Telephone & Telegraph; Radio Corp. of America; Motorola, Inc. and Masco Corp.* Final judgment, with respect to the complaint, defendant's motion for summary judgment on grounds of non-infringement is granted and judgment is entered in favor of defendant. Counterclaim does not infringe said patent, Apr. 12, 1977.

2,908,484, S. Uhl, BARBED WIRE SPIRAL, **filed** Apr. 23, 1976, D.C., S.D. Calif. (Los Angeles), Doc. CV76–1325–RJK, *Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft et al.* v. *Lindy's Industries, Inc.*

2,952,464, M. Stimler, SOUND TRACK SELECTION PHONOGRAPH, **filed** Apr. 7, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c1184, *The Seeburg Corporation of Delaware* v. *B.S.R. (U.S.A.), Ltd. and Playback, Inc.* **Same, filed** June 3, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c1978 (Case transferred from USDC, N.Y., Doc. 77–C–1748), *B.S.R. (U.S.A.) Ltd.* v. *The Seeburg Corporation of Delaware.*

2,966,718, D. H. Dave, METHOD FOR THE INSTALLATION OF REINFORCED CONCRETE FLOORS IN MULTI-STORIED BUILDINGS; **3,037,259,** same, APPARATUS FOR THE INSTALLATION OF REINFORCED CONCRETE FLOORS IN MULTI-STORIED BUILDINGS, **filed** Apr. 6, 1976, D.C. Del. (Wilmington), Doc. 76–C–1574, *D. H. Dave* v. *The Ceco Corporation et al.* It is hereby stipulated by the parties that the complaint and counterclaim herein be dismissed with prejudice, Jan. 19, 1977.

3,032,345, J. H. Lemelson, TARGET GAME; **3,385,566,** C. B. Dwyer, FENCE ASSEMBLY; **3,917,271,** Lemelson and Elfman, BALL FOR TARGET GAMES; **4,017,076,** H. S. Bal, TARGET GAME, **filed** May 6, 1977, D.C., S.D.N.Y., Doc. 77–C–2217, *Synergistics Research Corp.* v. *Henry S. Bal et al.*

3,037,259. (See 3,966,718.)

3,043,506, F. C. Bremer, ENVELOPE CONSTRUCTION, **filed** May 29, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1752, *Check Savers, Inc.* v. *Correction Systems, Inc.* By agreement order complaint and counterclaim dismissed with prejudice, Apr. 9, 1976.

3,163,645, De Stevens and Werner, DERIVATIVES OF 3,4-DIHYDRO-2-H-[1,2,4] - BENZOTHIADIAZINE - 1, 1-DIOXIDES, **filed** Sept. 27, 1976, D.C. Colo. (Denver), Doc. 76–W–957, *Ciba-Geigy Corporation* v. *Geneva Generics, Inc.* **Same, filed** Sept. 27, 1976, D.C., N.D. Ga. (Atlanta), Doc. C76–1589A, *Ciba-Geigy Corporation* v. *Reid-Provident Labs, Inc.* **Same, filed** Sept. 27, 1976, D.C., C.D. Calif. (Los Angeles), Doc. CV76–3066, *Ciba-Geigy Corp.* v. *Towne, Paulsen & Co. Inc.* **Same, filed** Sept. 28, 1976, D.C., S.D. Fla. (Miami), Doc. 76–1683–C–PF, *Ciba-Geigy Corporation* v. *Kelvin Pharmaceuticals, Inc.* Plaintiff voluntarily dismissed this action against defendant without prejudice, Sept. 30, 1976. **Same, filed** Sept. 28, 1976, D.C., S.D. Fla. (Fort Lauderdale), Doc. (FL)76–6422–C–JE, *Ciba-Geigy Corporation* v. *Generix Drug Corporation.* **Same, filed** Sept. 27, 1976, D.C. Colo (Denver), Doc. 76–W–957, *Ciba-Geigy Corporation* v. *Geneva Generics, Inc.* Transferred under MDL Order to USDC, District of New Jersey on June 8, 1977. **Same, filed** June 3, 1977, D.C.N.J. (Newark), Doc. 77–1084, *Ciba-Geigy Corporation* v. *Geneva Generics, Inc.* Consent judgment for dismissal of action, June 13, 1977. **Same, filed** June 3, 1977, D.C.N.J. (Newark), Doc. 77–1085, *Ciba-Geigy Corporation* v. *Generix Drug Corporation.* Consent judgment for dismissal of action, June 13, 1977. **Same, filed** June 7, 1977, D.C.N.J. (Newark), Doc. 77–1086, *Ciba-Geigy Corporation* v. *Reid Provident Labs, Inc.* **Same, filed** June 8, 1973, D.C.N.J. (Newark), Doc. C–806–73. *Ciba-Geigy Corporation* v. *Zenith Laboratories, Inc., Aberdeen Pharmacals Corporation and Paramount Surgical Supply Corp.* Consent judgment for dismissal of action, June 13, 1977. **Same, filed** June 7, 1977, D.C.N.J. (Newark), Doc. 77–1086, *Ciba-Geigy Corporation* v. *Reid Provident Labs, Inc.* Consent judgment for dismissal of action, June 13, 1977. **Same, filed** June 8, 1973, D.C.N.J. (Newark), Doc. 73–73, *Ciba-Geigy Corporation* v. *Zenith Laboratories, Inc., Aberdeen Pharmacals Corporation and Paramount Surgical Supply Corporation.* Judgment for dismissal of action, June 13, 1977. **Same, filed** June 3, 1977, D.C.N.J. (Newark), Doc. 77–1087, *Ciba-Geigy Corp.* v. *Towne, Paulsen & Co.* Consent judgment for dismissal of action, June 13, 1977. **Same, filed** Sept. 27, 1976, D.C.N.J. (Newark), Doc. C–76–1885, *Ciba-Geigy Corporation* v. *Barr Labs. Inc.* Consent judgment for dismissal of action, June 13, 1977.

3,241,876, W. S. Saunders, APPARATUS FOR REDUCING LINEAR AND LATERAL WIND RESISTANCE IN A TRACTOR-TRAILER COMBINATION VEHICLE; **3,309,131,** same, MEANS FOR REDUCING LINEAR WIND RESISTANCE IN SINGLE CHASSIS TYPE VEHICLES, **filed** Apr. 8, 1974, D.C., N.D. Ind. (South Bend), Doc. 74–82, *W. Selden Saunders* v. *I.R.C. & D Motor Freight, Inc.* Stipulation of dismissal without prejudice, Oct. 4, 1976.

3,268,636, R. G. Angell, Jr., METHOD AND APPARATUS FOR INJECTION MOLDING FOAMED PLASTIC ARTICLES, **filed** in the United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati), Doc. 75–2263, *Union Carbide Corporation* v. *Borg-Warner Corporation and Sund-Borg Machines Corporation.* The judgment of the district court that appellant's '636 patent is invalid for failure to disclose the best mode as required by 35 U.S.C. 112 is affirmed, Jan. 27, 1977.

3,293,405, R. J. Costanzo, ELECTRICALLY HEATED FOOTWEAR, **filed** Nov. 22, 1976, D.C. Conn. (Bridgeport), Doc. B–76–357, *Timely Products, Inc. and Benjamin M. Hines* v. *Raphael J. Costanzo.*

3,309,131. (See 3,241,876.)

3,313,545, J. R. Bartsch, UNITARY MOLDED GOLF BALL; **3,438,933,** same, MOLDING PROCESS AND COMPOSITION, **filed** Dec. 21, 1976, D.C., S.D.N.Y., Doc. 76–C–5714(MP), *PCR Golf Ball Company, Inc.* v. *Exim Sales Company.*

3,385,566. (See 3,032,345.)

3,438,933. (See 3,313,545.)

3,494,084, J. O. Hazen, VERTICALLY ADJUSTABLE UNDERFLOOR TRENCH AND METHOD OF ASSEMBLING AND INSTALLING THE SAME, **filed** Nov. 19, 1973, D.C., N.D. Ill. (Chicago), Doc. 73c2940, *H. H. Robertson Company* v. *Square D Company.* Ordered that the complaint and the counterclaim are dismissed with prejudice, May 2, 1977.

3,502,645, D. G. Carmichael, WATER-INSOLUBLE BENZOTHIAZOLE MONOAZO DYES, **filed** Mar. 15, 1977, D.C. Del. (Wilmington), Doc. 77–94, *Martin Marietta Corp.* v. *Kewanee Industries, Inc.*

3,630,505, B. R. Mackay, SILVER RECOVERY; **3,692,291,** M. T. Mackay, same; **3,744,995,** B. R. Mackay, same, **filed** Mar. 28, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–1128–WMB, *Byron R. Mackay et al.* v. *West Coast Silver Refining Corp.*

3,692,291. (See 3,630,505.)

3,730,937, Boggs and Miller, ELASTOMERIC CORROSION-INHIBITING COATING AND SEALING MATERIAL, **filed** Apr. 24, 1974, D.C. Del. (Wilmington), Doc. 74–81, *Products Research & Chemical Corporation* v. *Teledyne, Inc.* It is hereby ordered that the above civil action is dismissed with prejudice, Dec. 20, 1976.

3,733,309, Wyeth, Newman and Gay, BIAXIALLY ORIENTED POLY(ETHYLENE TEREPHTHALATE) BOTTLE, **filed** Jan. 24, 1977, D.C. N.D. Ohio (Toledo), Doc. C77–39, *Owens-Illinois, Inc. et al.* v. *E. I. du Pont de Nemours & Co.*

3,737,866, R. H. Gruner, DATA STORAGE AND RETRIEVAL SYSTEM, **filed** June 7, 1973, D.C. Del. (Wilmington), Doc. 4674, *Data General Corporation* v. *Digital Computer Controls, Inc.* Pursuant to Rule 41(a)(1)(ii), by stipulation this action is hereby dismissed, Feb. 1, 1977.

3,744,995. (See 3,630,505.)

3,750,722, R. L. Nowak, FUNNEL, **filed** Oct. 23, 1974, D.C. Del. (Wilmington), Doc. 74–217, 75–174 consol., *Funnelcap Inc.* v. *Orion Industries, Inc. and Corporation Trust Company.* Judgment, the claim in said patent is invalid under 35 U.S.C. 102 as being anticipated, and even if not anticipated, is invalid under 35 U.S.C. 103 as being obvious in view of the prior art, Dec. 20, 1976. **Same, filed** Dec. 5, 1974, D.C., C.D. Calif. (Los Angeles), Doc. CV74–3571–WPG, consol. w/ C.A. 74–217, *Cal Custom Accessories, Inc.* v. *Funnelcap, Inc.* Judgment, claim in said patent is invalid under 35 U.S.C. 103 as being obvious in view of the prior art, Dec. 20, 1976.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,547,813, Re. S.N. 831,101, Filed Sept. 7, 1977, Cl. 210/7, BIOCHEMICAL OXIDATION WITH LOW SLUDGE RECYCLE, Ernest K. Robinson, et al., Owner of Record: *Union Carbide Corporation, New York, N.Y.,* Attorney or Agent: Harrie M. Humphreys, et al., Ex. Gp.: 176

3,547,814, Re. S.N. 831,100, Filed Sept. 7, 1977, Cl. 210/7, BIO-OXIDATION WITH LOW SLUDGE YIELD, John R. McWhirter, Owner of Record: *Union Carbide Corporation, New York, N.Y.,* Attorney or Agent: Harrie M. Humphreys, et al., Ex. Gp.: 176

3,547,815, Re. S.N. 831,102, Filed Sept. 7, 1977, Cl. 210/7, STAGED OXYGENATION OF BOD-CONTAINING WATER, John R. McWhirter, Owner of Record: *Union Carbide Corporation, New York, N.Y.,* Attorney or Agent: Harrie M. Humphreys, et al., Ex. Gp.: 176

3,697,939, Re. S.N. 815,518, Filed July 14, 1977, Cl. 340/15.5 TD, CORRECTIONS FOR SEISMIC DATA OBTAINED FROM EXPANDING-SPREAD, Albert W. Musgrave, Owner of Record: *Mobil Oil Corporation, New York, N.Y.,* Attorney or Agent: Michael G. Gilman, et al., Ex. Gp.: 222

3,877,550, Re. S.N. 827,957, Filed Aug. 26, 1977, Cl. 188/106 P, COMBINATION SERVICE AND PARKING BRAKE, Emil H. Hahn, Owner of Record: *Lambert Brake Corporation, St. Joseph, Mich.,* Attorney or Agent: Richard R. Trexler, et al., Ex. Gp.: 315

3,901,601, Re. S.N. 819,365, Filed July 27, 1977, Cl. 356/97, CHOPPER ARRANGEMENT FOR ATOMIC ABSORPTION SPECTROPHOTOMETER, Werner K. Lahmann, Owner of Record: *Inventor,* Attorney or Agent: S. A. Giarratana, et al., Ex. Gp.: 257

3,918,268, Re. S.N. 831,032, Filed Sept. 6, 1977, Cl. 62/150, HEAT PUMP WITH FROST-FREE OUTDOOR COIL, Otto J. Nussbaum, Owner of Record: *Halstead Industries, Inc., Scottsboro, Ala.,* Attorney or Agent: T. H. Murray, Ex. Gp.: 344

3,978,350, Re. S.N. 829,321, Filed Aug. 31, 1977, Cl. 307/255, DUAL MODE SOLID STATE POWER SWITCH, Louis C. Maus, et al., Owner of Record: *The United States of America, as represented by the Administrator of the NASA, Washington, D.C.,* Attorney or Agent: George J. Porter, et al., Ex. Gp.: 254

3,991,222, Re. S.N. 823,983, Filed Aug. 12, 1977, Cl. 426/550, DEHYDRATED POTATO PROCESSES, Roderick G. Beck, et al., Owner of Record: *American Potato Company, San Francisco, Calif.,* Ex. Gp.: 172

4,030,881 Re. S.N. 827,775, Filed Aug. 25, 1977, Cl. 8/39 C, COLORATION PROCESS, Violet Boyd, et al., Owner of Record: *Imperial Chemical Industries Limited, London, England,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 144

4,032,529, Re. S.N. 826,683, Filed Aug. 22, 1977, Cl. 260/293.54, AMINOMETHANOBENZAZOCINE INTERMEDIATES, Mark P. Wentland, et al., Owner of Record: *Sterling Drug Inc., New York, N.Y.,* Attorney or Agent: B. Woodrow Wyatt, et al., Ex. Gp.: 121

PATENT NOTICES

Certificates of Correction for the Week of Oct. 25, 1977

Re. 29,242	4,016,148	4,031,768	4,036,314
D. 236,952	4,016,768	4,031,862	4,036,343
D. 237,895	4,017,134	4,032,003	4,036,383
D. 242,251	4,017,175	4,032,007	4,036,401
D. 244,300	4,017,398	4,032,104	4,036,421
3,119,889	4,017,481	4,032,198	4,036,444
3,820,001	4,017,876	4,032,276	4,036,455
3,835,068	4,018,091	4,032,466	4,036,481
3,855,338	4,018,274	4,032,533	4,036,526
3,900,443	4,018,460	4,032,815	4,036,594
3,901,885	4,018,482	4,032,847	4,036,722
3,923,380	4,018,493	4,032,929	4,036,730
3,931,234	4,018,728	4,032,944	4,036,736
3,934,369	4,018,846	4,033,011	4,036,771
3,941,908	4,019,229	4,033,021	4,036,801
3,943,227	4,021,547	4,033,135	4,036,844
3,956,239	4,021,739	4,033,314	4,036,847
3,966,238	4,022,630	4,033,494	4,036,854
3,968,625	4,022,756	4,033,831	4,036,945
3,969,674	4,023,077	4,033,846	4,036,983
3,969,972	4,023,124	4,033,896	4,037,013
3,971,760	4,023,182	4,033,909	4,037,100
3,972,849	4,023,416	4,033,971	4,037,112
3,977,132	4,023,432	4,034,077	4,037,140
3,982,301	4,023,985	4,034,108	4,037,300
3,983,055	4,024,254	4,034,181	4,037,310
3,983,385	4,024,611	4,034,278	4,037,325
3,983,401	4,024,877	4,034,345	4,037,368
3,986,565	4,025,001	4,034,377	4,037,403
3,991,667	4,025,317	4,034,399	4,037,502
3,993,680	4,025,437	4,034,493	4,037,565
3,995,336	4,026,113	4,034,588	4,037,649
3,996,066	4,027,015	4,034,696	4,037,792
3,999,055	4,027,458	4,034,700	4,037,820
3,999,203	4,028,382	4,034,827	4,037,895
3,999,303	4,028,539	4,034,832	4,038,122
3,999,976	4,028,566	4,034,879	4,038,124
4,000,110	4,028,585	4,035,191	4,038,168
4,000,889	4,029,012	4,035,197	4,038,188
4,001,339	4,029,107	4,035,232	4,038,283
4,002,688	4,029,509	4,035,292	4,038,301
4,006,160	4,029,567	4,035,304	4,038,365
4,006,892	4,029,577	4,035,372	4,038,479
4,007,334	4,029,625	4,035,377	4,038,856
4,008,179	4,029,697	4,035,444	4,038,866
4,008,325	4,029,729	4,035,469	4,038,888
4,008,333	4,029,988	4,035,627	4,039,043
4,008,980	4,030,040	4,035,715	4,039,144
4,011,201	4,030,059	4,035,743	4,039,188
4,011,276	4,030,092	4,035,761	4,039,209
4,012,636	4,030,241	4,036,040	4,039,343
4,012,734	4,030,366	4,036,052	4,039,449
4,012,759	4,030,504	4,036,104	4,039,491
4,013,643	4,031,014	4,036,132	4,039,696
4,013,684	4,031,212	4,036,143	4,039,832
4,014,248	4,031,246	4,036,165	4,039,974
4,014,394	4,031,279	4,036,177	4,040,029
4,014,593	4,031,317	4,036,212	4,040,186
4,014,682	4,031,330	4,036,215	4,040,358
4,015,598	4,031,354	4,036,224	4,040,576
4,015,865	4,031,563	4,036,242	4,041,559

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,445,398, E. Jungermann and D. Taber, SYNERGISTIC ANTIBACTERIAL COMPOSITIONS, Interference No. 98,060, decided September 30, 1975, claims 4 and 5.

Patent No. 3,473,297, Z. Tamura and Y. Hishinuma, METHOD AND APPARATUS FOR DESULFURIZING COMBUSTION WASTE GASES, Interference No. 99,022, decided June 28, 1977, claims 1 and 3.

Patent No. 3,486,852, Z. Tamura and Y. Hishinuma, PROCESS AND APPARATUS FOR THE DESULFURIZATION OF INDUSTRIAL WASTE GASES, Interference No. 99,023, decided June 28, 1977, claims 1 and 2.

Patent No. 3,617,576, A. F. Kerst, METHODS OF SCALE INHIBITION, Interference No. 98,787, decided June 3, 1977, claims 1, 5, 6 and 12.

Patent No. 3,711,432, N. Shah, LOW SHRINK POLYESTER RESIN SYSTEMS FORMED OF A MIXTURE OF UNSATURATED POLYESTER RESIN, MONOMERIC COPOLYMERIZABLE COMPONENT AND CELLULOSE ORGANIC ESTER, Interference No. 98,607, decided July 21, 1977, claims 1, 3, 4, 5, 6, 7, 8, 10, 11 and 12.

Patent No. 3,801,623, J. Martel, E. Toromanoff and J. Buendia, CYCLOPENTANONE DERIVATIVES, Interference No. 98,819, decided June 9, 1977, claims 1 and 3.

Patent No. 3,924,905, V. M. Simmons, REMOVAL OF OBSTRUCTING SNOW FROM WITHIN SNOWMOBILE TRACK ENCLOSURES, Interference No. 99,398, decided July 11, 1977, claims 1–6.

Patent No. 3,958,038, D. O. Hitzman, RECOVERY OF CELLULAR PROTEIN PRODUCTS FROM MICROBIOLOGICAL SYNTHESIS MASSES, Interference No. 99,444, decided July 11, 1977, claim 1.

Disclaimer

3,894,863.—*Walter L. Lachman,* Concord, Mass. *Robert A. Penty,* Kennebunk, Maine and *Paul F. Jahn,* Chelmsford, Mass. GRAPHITE COMPOSITE. Patent dated July 15, 1975. Disclaimer filed Aug. 18, 1977, by the assignee, *Fiber Materials, Inc.*

Hereby enters this disclaimer to all claims of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 27, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-30-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-17-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-21-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-6-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	7-26-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-7-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	8-17-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	3-8-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-25-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-15-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-5-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	11-24-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	9-3-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	9-16-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	1-3-77

Expiration of patents: The patents within the range of numbers indicated below expire during August 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,947,001 to 2,951,248, inclusive
Plant Patents..... Numbers 1,963 to 1,969, inclusive

REISSUE PATENTS

GRANTED OCTOBER 25, 1977

ERRATA

For CLASS	See PATENT NO.
364–724	29,460

REISSUES

OCTOBER 25, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

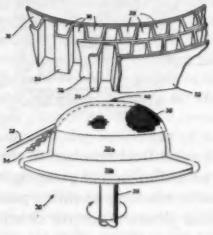
Re. 29,452
HEADWEAR CONSTRUCTION

Charles E. Townsend, Jr., 11 Ranch Road, Orinda, Calif. 94563

Original No. 3,811,130, dated May 21, 1974, Ser. No. 297,140, Oct. 12, 1972. Continuation-in-part of Ser. No. 89,218, Nov. 13, 1970, abandoned. Application for reissue Dec. 30, 1974, Ser. No. 537,792

Int. Cl.[2] A42B *1/18*

U.S. Cl. 2—177 **1 Claim**



10. A headwear construction having a shaped crown comprising an arcuately contoured section of cellular honeycomb having compound curvature and disposed with the axes of its opened cells extending radially therethrough; each cell of said honeycomb having a substantially equal cross-sectional dimension; the thickness of the honeycomb measured in the direction of the cell axes and the nominal diameter of the cells being related to one another to limit the angle of incidence through which overhead sunrays can be transmitted through any given cell; the cumulative cross-sectional open cell areas of the crown amounting to at least 90 percent of the total surface area of the crown; the radius of curvature of the arcuately contoured honeycomb section in each compound direction being sufficiently tight to establish a progressive divergence of angularity between adjacent cell axes in each said direction whereby to limit direct sunray transmittal through the crown to a minor fractional area thereof at any given instant.

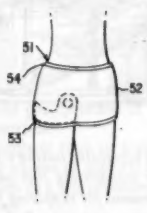
Re. 29,453
DRAINAGE BAG FOR HUMAN BODY

Rosemary B. Weddle, Grafton, Va., assignor to Marsan Manufacturing Company, Inc., Wausau, Wis.

Original No. 3,931,819, dated Jan. 13, 1976, Ser. No. 545,352, Jan. 30, 1975. Continuation of Ser. No. 398,382, Sept. 18, 1973, abandoned. Application for reissue Oct. 6, 1976, Ser. No. 730,267

Int. Cl.[2] A61F *5/44*

U.S. Cl. 128—283 **15 Claims**



1. A drainage bag for attaching around a drainage opening in the human body and to be worn adjacent the skin comprising:

a soft layer of the peripheral dimensions of the drainage bag and having an opening therein,

a back plastic layer of the peripheral dimensions of the drainage bag and having an opening therein affixed to said soft layer to be coextensive therewith and having its opening coaxial with said soft layer opening,

a front plastic layer of the peripheral dimensions of the drainage bag and sealed about its periphery to said back plastic layer on the side of said back plastic layer not [laminated] *affixed* to said soft layer,

[a front plastic layer of the peripheral dimensions of the drainage bag and sealed about its periphery to said back plastic layer on the side of said back plastic layer not laminated to said soft layer,]

a sealing washer on the back side of said drainage bag having an opening therein, and

a seal between the area surrounding said seal washer opening and the area surrounding said back plastic layer opening.

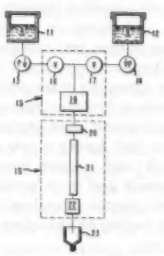
Re. 29,454
METHOD FOR PRODUCING A GRADIENT ELUTION

Howard L. Ashmead, Newark, Del.; Sydnor H. Byrne, Jr., La Canada, Calif., and John P. Wolf, III, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 3,799,396, dated Mar. 26, 1974, Ser. No. 265,995, June 26, 1972. Division of Ser. No. 36,633, May 12, 1970, Pat. No. 3,712,513. Application for reissue Feb. 20, 1976, Ser. No. 660,033

Int. Cl.[2] B01D *15/08*

U.S. Cl. 222—1 **3 Claims**



1. A method of producing an eluent containing a time varying concentration of two liquids, comprising the steps of:

a. supplying a first liquid to a first operative portion of normally closed valving means;

b. supplying a second liquid to a second operative portion of said normally closed valving means;

c. alternately activating said first operative portion of said valving means for a first set period of time to allow a first set volume of said first liquid to enter a mixing region and then activating said second operative portion of said valving means for a second set period of time to allow a second set volume of said second liquid to enter said mixing region and mix with said first set volume of first liquid to form a mixture containing a set concentration of said first and second liquids, *said first and second set periods of time being such that the volume of said first and second liquid entering said mixing region during each period when either operative portion of said valving means is activated is less than the volume of said mixing region;*

d. allowing a portion of said mixture to leave said mixing region thereby producing an eluent having a concentra-

tion of said first and second liquid, the instantaneous concentration of which is equal to the instantaneous concentration of said first and second liquids at the downstream end of said mixing region at the time said portion of said mixture leaves said mixing region; and

e. varying said first and second set periods of time during which said first and second operative portions of said valving means are respectively activated, whereby the concentrations of said first and second liquids in said mixture are gradually changed so that an eluent having a time varying concentration of said first and second liquids is produced.

Re. 29,455

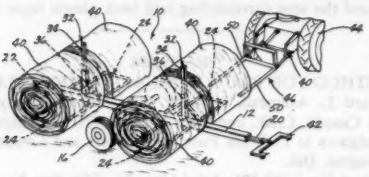
HAY BALER TRAILER

Darrell E. Slayton, Casey, Iowa, assignor to Dale E. Slayton, Casey, Iowa

Original No. 3,826,515, dated July 30, 1974, Ser. No. 420,265, Nov. 29, 1973. Application for reissue Nov. 28, 1975, Ser. No. 636,035

Int. Cl.[2] B62D *21/04*

U.S. Cl. 280—106 T **15 Claims**



12. A hay bale trailer comprising,

an elongated longitudinally extending frame member having forward and rearward,

an axle having wheels at opposite ends supportingly engaging said frame member intermediate its ends,

a pair of bale supports extending laterally in opposite directions outwardly from said frame on opposite side thereof and longitudinally spaced from said axle and wheels, each of said supports having longitudinally spaced forward and rear hay support members extending transversely of said frame and each of said members having a transversely extending open area adjacent one side and extending substantially the length thereof whereby a fork having a pair of spaced apart teeth may register with said support members in side-by-side relationship therewith and move vertically above and below the plane of said support members without engaging an obstruction when loading or unloading hay onto each of said supports, and

an upstanding stop means on said frame member between the bale supports of said pair of supports to separate bales of hay on said supports.

Re. 29,456

PUMPS WITH SERVO-TYPE ACTUATION FOR CHEEK PLATE UNLOADING

Gilbert H. Drutchas, Birmingham, Mich., and George A. Berman, Lafayette, Ind., assignors to TRW Inc., Cleveland, Ohio

Original No. 3,822,965, dated July 9, 1974, Ser. No. 303,115, Nov. 2, 1972. Application for reissue July 8, 1976, Ser. No. 703,372

Int. Cl.[2] F04B *49/02*

U.S. Cl. 417—53 **21 Claims**

9. In combination,

a pump having housing means forming a pumping chamber having inlet and outlet portions,

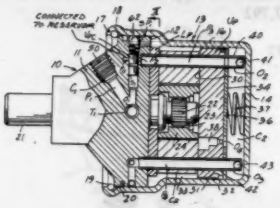
rotary fluid displacement means in said pumping chamber for moving the fluid at increased pressure from the inlet to the outlet portions,

a cheek plate adjacent said pumping chamber having a sealing face for sealing the inlet and outlet portions during operation of the pump,

means including said housing forming a static pressure control chamber behind said cheek plate and having an orificed metering passage to load said cheek plate with fluid at pump-generated pressure,

a seal between said cheek plate and said housing blocking flow into said cavity except through said orificed metering passage,

means including said housing forming a pumping circuit including an outlet line and a return line for said pump



receiving said spent fluid returned to the pump,

means forming an orifice in said pumping circuit,

and a servo valve controlling a venting passage in said housing venting said pressure control chamber to a zone at lower pressure and having actuating means responsive to the pressure drop across said orifice,

thereby valving the cheek plate in servo ratio proportion with the servo valve and directly by-passing the outlet portions of the pump to the inlet portions adjacent the sealing face of the cheek plate to modulate pump flow output.

Re. 29,457

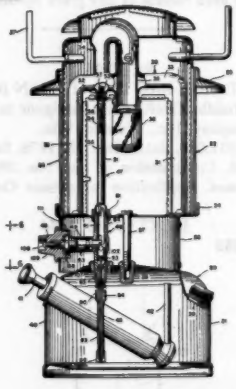
FUEL CONTROL MEANS FOR BURNERS

Thomas C. Hastings, Willowdale, Canada, assignor to The Coleman Company, Inc., Wichita, Kans.

Original No. 3,807,938, dated Apr. 30, 1974, Ser. No. 378,710, July 12, 1973. Application for reissue Mar. 29, 1976, Ser. No. 671,284

Int. Cl.[2] F23D *11/38, 13/28*

U.S. Cl. 431—123 **8 Claims**



13. In a fuel burning apparatus having a fuel tank, fuel burning means, and means for pressurizing fuel within the fuel tank, an improved fuel control means for supplying fuel from the fuel tank to the fuel burning means comprising fuel conduit means extending from the fuel tank toward the fuel burning means, the fuel conduit means having a first end provided with a fuel inlet opening

positioned within the fuel tank and a second end provided with a fuel outlet orifice for supplying fuel to the fuel burning means, valve means within the fuel conduit means movable between a closed position in which fuel flow through the fuel conduit means is prevented and an open position in which the fuel flow through the fuel conduit means is permitted, inlet restricting means movable within the fuel conduit means with the valve means for restricting the fuel inlet orifice of the conduit means, outlet cleaning means mounted within the fuel conduit means for movement into and out of the fuel outlet orifice of the fuel conduit means, a single control member movably mounted on the apparatus, and means operably connecting the control member with the valve means and the outlet cleaning means for moving the valve means and the inlet restricting means and the outlet cleaning means in response to movement of the control member, the control member being movable between:

a. a first or off position in which the connecting means maintains the outlet cleaning means out of the fuel outlet orifice and maintains the valve means in the closed position,

b. a second or cleaning position in which the connecting means maintains the outlet cleaning means in the fuel outlet orifice and maintains the valve means in the closed position,

c. a third or light position in which the connecting means maintains the outlet cleaning means out of the fuel outlet orifice and maintains the valve means in the open position and the inlet restricting means in the fuel inlet orifice, and

d. a fouth or run position in which the connecting means maintains the outlet cleaning means out of the fuel outlet orifice and maintains the valve means in the open position and the inlet restricting means out of the fuel inlet orifice whereby the fuel outlet orifice is cleaned by the outlet cleaning means twice during each cycle in which the control member is turned from the off position to the run position and back to the off position and whereby fuel within the fuel conduit means between the valve means and the fuel outlet orifice can escape through the fuel outlet orifice when the control member is returned to the off position.

Re. 29,458

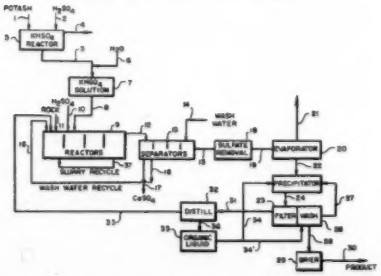
POTASSIUM PHOSPHATE MANUFACTURE

Erhart K. Drechsel, Houston, Tex.; John B. Sardisco, and James R. Stewart, Jr., both of Shreveport, La., assignors to Pennzoil Company, Shreveport, La.

Original No. 3,697,246, dated Oct. 10, 1972, Ser. No. 81,280, Oct. 16, 1970. Application for reissue July 18, 1975, Ser. No. 597,180

Int. Cl.[2] C05B *7/00*

U.S. Cl. 71—34 **11 Claims**



9. A process for the precipitation of potassium dihydrogen phoshate which comprises:

(1) contacting phosphate rock or a solubilized form thereof with a sufficient excess of sulfuric acid to drive the reaction to completion at a temperature of about 40° to 90° C. in a main reactor;

(2) reacting potassium chloride and sulfuric acid in a separate reactor at a temperature of 250° to 300° C. with removal of the dry hydrogen chloride evolved and dissolving the resulting potassium hydrogen sulfate with water to form a 10–50% aqueous solution;

(3) adding said 10–50% aqueous solution of potassium hydrogen sulfate to said main reactor in sufficient amount to form a reaction mixture containing ions of potassium dihydrogen phosphate and at a rate so as to minimize the formation of insoluble salts of $KHSO_4$ and $CaSO_4$ and under such conditions that the concentration of dissolved solids in the reaction mixture does not exceed about 60%;

(4) maintaining the reaction mixture under these conditions for formation of an easily filterable solid, calcium sulfate precipitate;

(5) removing the solid calcium sulfate from the reaction mixture to provide a filtrate;

(6) contacting said filtrate with a calcium-bearing material selected from the group consisting of phosphate rock, tricalcium phosphate, dicalcium phosphate, calcium oxide and mixtures thereof, alternatively or successively, at a temperature of 40°–90° C. to precipitate additional sulfate ion and partially neutralize the mixture and removing the precipitated solids to provide a filtrate lower in sulfate ion and containing potassium dihydrogen phosphate:

(7) recovering the solid potassium dihydrogen phosphate from the filtrate to provide a phosphoric acid mother liquor; and

(8) recycling the mother liquor to the main reactor.

Re. 29,459

EQUILIBRATION OF LOWER ALKYL SUBSTITUTED POLYALKYL AROMATIC HYDROCARBONS WITH REDUCED DISPROPORTIONATION

John J. Brodbeck, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Original No. 3,647,898, dated Mar. 7, 1972, Ser. No. 2,948, Jan. 14, 1970. Application for reissue Dec. 5, 1974, Ser. No. 529,304

Int. Cl.[2] C07C *15/08*

U.S. Cl. 260—668 A **9 Claims**

1. The process for the catalytic isomerization of an alkyl substituted polyalkyl aromatic hydrocarbon feed which comprises contacting the feed with a silica-alumina isomerization catalyst at a temperature in the range from about 700° F. to 1000° F., at a liquid hourly space velocity in the range from about 0.1 to 10, and at a pressure below about 200 p.s.i.g., wherein said catalyst consists essentially of a silica and alumina composite having a surface area in the range from about 250 to 400 square meters per gram, wherein at least 40 percent of the catalyst *pore volume is from* pores **[**have**]** *having* a radius greater than about 45 A., said feed having an aromatic carbocyclic carbon atom content below about 13, and having from 2 to about 4 of the same or different lower alkyl substituent groups; and said composite having a silica to alumina weight ratio in the range from about 70–90 to about 10–30, respectively.

Re. 29,460

PCM TONE RECEIVER USING OPTIMUM STATISTICAL TECHNIQUE

Jeffrey P. Mills, Forest Park, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Original No. 3,961,167, dated June 1, 1976, Ser. No. 490,450, July 22, 1974. Application for reissue Feb. 28, 1977, Ser. No. 772,391

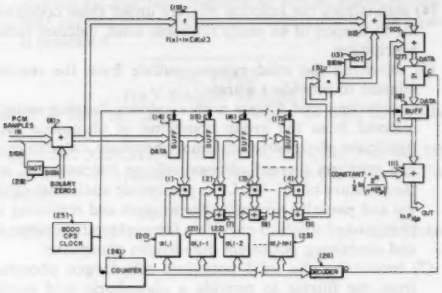
Int. Cl.[2] G06F *15/36*; H04Q *11/00*

U.S. Cl. 364—724 **8 Claims**

1. A pulse code modulation (PCM) tone receiver for determining the probability that a particular combination of audio frequencies was transmitted by monitoring PCM samples, said PCM tone receiver comprising:

means for storing N PCM samples as received, where N is an integer, c_1 through c_N representing a quantization of the analog voltage waveform sampled;

first means for multiplying said N samples represented by c_1 through c_N by a set of fixed predetermined constants a_{i1} through a_{iN}, where i is a fixed point binary number ranging from 1 to N and where a_{i1} through a_{iN} are determined from the covariance matrix of the process represented by the particular tone combination to be detected, said first mutliplying means including means for storing said fixed predetermined constants a_{i1} through a_{iN}, said first multiplier means operating on said stored output of said storage means;



means for combining said multiplied products of samples c_1 through c_N and constants a_{i1} through a_{iN} according to the equation

$$w_i = \sum_{k=1}^{i} a_{ik} c_k$$

means for squaring said resulting combined w_i term;

means for accumulating the resulting w_i^2 term as each of said N PCM samples are received;

second means for multiplying said accumulated samples by a [set of] fixed [constants] *constant* related to the covariance matrix with the resulting product representing the probability that the specific combination of audio frequencies was transmitted.

Re. 29,461

HOLOGRAM GRAPHIC DATA TABLET APPARATUS USING A VERNIER

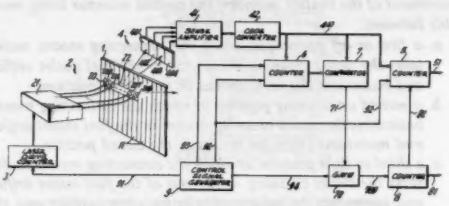
Masahiro Moriwaki; Mitsuhito Sakaguchi, and Yoshinari Mita, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Original No. 3,906,465, dated Sept. 16, 1975, Ser. No. 499,975, Aug. 23, 1974. Application for reissue Oct. 4, 1976, Ser. No. 729,186

Claims priority, application Japan, Aug. 31, 1973, 48-98656; Aug. 31, 1973, 48-98664; Sept. 5, 1973, 48-99930; Sept. 5, 1973, 48-99931

Int. Cl.² G02B *27/00*

U.S. Cl. 340—173 LM **5 Claims**



1. A hologram graphic data tablet apparatus comprising a hologram plate having a plurality of position-representing mini-holograms recorded thereon, a reference laser, an array of n or (n − 1) vernier lasers arranged at an interval of (n − 1)/n of the width of one of said mini-holograms, means for energizing said reference and said vernier lasers in a predetermined time sequence, means for detecting the light rays emitted by said lasers and diffracted at said mini-holograms forming a reconstructed image, and means for processing the output of said detecting means to produce a positional code having a greater number of bits than the positional code obtained directly from said mini-holograms depending on whether the output codes from said detecting means are the result of irradiation by said reference laser or by said vernier laser array.

PLANT PATENTS

GRANTED OCTOBER 25, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,132
WALNUT TREE

Olan R. Genn, Modesto, Calif., assignor to Olan R. Genn and Fern F. Genn, both of Modesto, Calif.

Filed Jan. 4, 1977, Ser. No. 757,053
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—32 **1 Claim**

1. A new and distinct variety of English walnut tree, substantially as illustrated and described, which is of medium size, vigorous, spreading densely foliated with large, early season, elliptic leaves, very early and abundant in flowering, and a regular, very early bearer, with medium productivity, of small, round, uniform, thin and soft-shelled, well-sealed, well-filled nuts having relatively large, plump kernels, the nuts—which drop off early—having hulls which often split so that the nuts drop free; the tree being especially characterized by its resistance to extreme cold without serious damage.

4,133
CHRYSANTHEMUM

Norman Mock, 1363 Murphy Ave., San Jose, Calif. 95131

Filed Oct. 26, 1976, Ser. No. 735,149
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum, substantially as described and pictured herein, characterized by its very large velvety yellow blooms, vigorous growth and 9 week response.

4,134
CHRYSANTHEMUM

Norman Mock, 1363 Murphy Ave., San Jose, Calif. 95131

Filed Oct. 26, 1976, Ser. No. 735,156
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly in uniqueness when compared to the parent cultivar Red Rover by its deeper red petal coloration, shorter petals, increased resistance to fading, smaller blooms and greater convexity of the individual petals.

4,135
CHRYSANTHEMUM

Norman Mock, 1363 Murphy Ave., San Jose, Calif. 95131

Filed Oct. 26, 1976, Ser. No. 735,323
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum, substantially as described and pictured herein, characterized by its velvety yellow blooms, vigorous growth, 9 week response and persistence.

4,136
COLEONEMA PULCHRUM PLANT

Juris Edgar Schutz, and Murdoch Niall McIntosh, both of Sydney, Australia, assignors to Juris E. Schutz; Juris E. Schutz, by said Murdoch N. McIntosh; Solveiga M. Schutz; Peteris Kepitis and Elga Kepitis, by said Juris E. Schutz, all of Sydney, Australia, part interest to each

Filed Sept. 8, 1976, Ser. No. 721,543
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—54 **1 Claim**

1. A new and distinct cultivar of *Coleonema pulchrum* referred to by the cultivar name Sunset Gold and particularly characterized as to uniqueness by its dwarf growth form, golden color foliage and its generally pink flower color.

4,137
CHRYSANTHEMUM NAMED IMPERIAL YELLOW

Takaaki Peter Kashima, 923 Woodside Road, Redwood City, Calif. 94061

Filed Jan. 10, 1977, Ser. No. 758,339
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct variety of chrysanthemum plant, substantially as herein shown and described, characterized by the large size of its blooms and their light yellow coloration, the greater plant height and the increased size, strength and length of its stems.

PATENTS

GRANTED OCTOBER 25, 1977

ERRATA

For CLASS	See PATENT NO.
005–009 R	4,054,956
407–108	4,054,977
219–390	4,055,219
180–132	4,055,232
085–001 SS	4,055,385
264–022	4,055,526
542–413	4,055,563
542–413	4,055,564
548–301	4,055,570
548–335	4,055,573
423–447.4	4,055,583
560–023	4,055,588
560–121	4,055,589
560–179	4,055,590
096–087 R	4,055,685
364–466	4,055,748
364–424	4,055,750
364–500	4,055,751
364–551	4,055,752
364–466	4,055,753
364–705	4,055,755
364–725	4,055,756
364–715	4,055,757
364–821	4,055,758
362–159	4,055,759
362–352	4,055,760

PATENTS

GRANTED OCTOBER 25, 1977

ERRATA

PATENTS

GRANTED OCTOBER 25, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,054,952

BELT ASSEMBLY

Roger T. Swallow, Crystal Lake, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Apr. 13, 1976, Ser. No. 676,607
Int. Cl.[2] A41F *9/00*
U.S. Cl. 2—338 **16 Claims**

1. A belt assembly, comprising:

elongated belt means having first surface means;

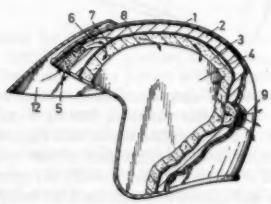
housing means having tunnel means to receive a portion of the belt means and second surface means in the tunnel means facing the first surface means of the belt means, said second surface means being retained in the housing means to prevent substantial relative movement therethrough, with the size of the tunnel means relative the belt means being sufficiently small to maintain the first and second surface means in close engagement, said first and second surface means cooperating to provide substantial resistance against movement of the belt means in the tunnel means and normally retain the belt means at a selected position in the housing means, and said first and second surface means releasing sufficiently to permit movement of the belt means in the tunnel means relative the second surface means responsive to substantial forces applied against the belt means.

4,054,953

CRASH HELMET

Philippe De Barsy, 6, dreve des Etangs, Bousval, Belgium

Filed Aug. 30, 1976, Ser. No. 718,474
Claims priority, application Belgium, Sept. 2, 1975, 832996
Int. Cl.[2] A42B *3/02*
U.S. Cl. 2—414 **3 Claims**



1. A crash helmet, particularly for drivers and passengers of motor vehicles such as motorcycles, motorbikes, and the like, said crash helmet having a solid outer wall for covering the head, said wall being lined inside with means for cushioning impacts, said helmet comprising at least one air inlet provided in that helmet area over which sweeps the air and so arranged as to canalize the air inside the helmet, means to distribute the air inside the helmet and at least one opening provided in the helmet wall in that area thereof over which the air does not sweep, to let the air escape from said helmet,

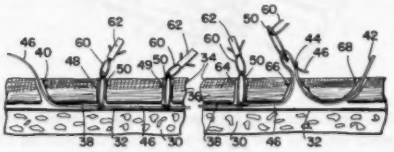
said means for cushioning impacts comprising a first layer of compressible material including expanded polystyrene, which lines the helmet inner wall and a second material layer lining said first layer, which is an open-cell foam, said means for distributing the air inside the helmet comprising a duct provided in said first material layer from said air inlet to said second material layer, the air flowing out from said duct being distributed inside the helmet through the open cells of said second material layer.

4,054,954

METHOD OF PROVIDING HAIR AT THE SCALP

Taisuke Nakayama, and Sokichi Nakajima, both of Tokyo, Japan, assignors to Tokyo Gihatsu Seikei Company Limited, Tokyo, Japan

Filed May 24, 1976, Ser. No. 689,490
Int. Cl.[2] A61F *1/00*; A61B *17/00*
U.S. Cl. 3—1 **9 Claims**



1. In the method of providing hair at the scalp wherein a preformed hairpiece is attached to an anchoring suture in the scalp, the improvement comprising the steps of:

a. inserting a needle having an eye at the free end thereof in said scalp at a first point;

b. passing said needle under the exterior surface of said scalp and out of said scalp at a reference point spaced from said first point;

c. threading a suture filament through said eye at said free end of said needle and withdrawing said needle from said scalp drawing said suture filament into said scalp at said reference point, under the exterior surface of said scalp and out of said scalp at said first point;

d. reinserting said needle in said scalp at a second point spaced from said first point;

e. passing said needle under the exterior surface of said scalp and out of said scalp at said first point;

f. threading a first ring on said suture filament at said first point and then threading said suture filament through said eye at said free end of said needle at said first point;

g. again withdrawng said needle from said scalp drawing said suture filament into said scalp at said first point, under the exterior surface of said scalp and out of said scalp at said second point, whereby said first ring is pulled into said scalp at said first point, and

h. attaching a hairpiece to said first ring at the exterior surface of said scalp.

4,054,955

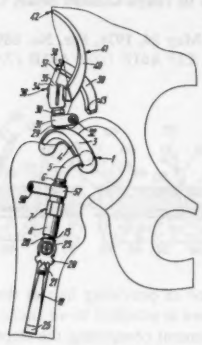
ORTHOPAEDIC ENDOAPPARATUS DESIGNED TO GROW A NEW LIVE SHOULDER AND HIP JOINT, TO RECONSTRUCT A DEFORMED JOINT OR TO RESTORE A PATHOLOGICALLY DYSPLASTIC AND CONGENITALLY LUXATED JOINT

Arnold Ivanovich Seppo, ulitsa Taara 4, Tallin, U.S.S.R.

Filed Jan. 29, 1976, Ser. No. 653,544
Int. Cl.[2] A61F *1/24, 5/00*
U.S. Cl. 3—1.91 **6 Claims**

1. An orthopaedic endoapparatus designed to grow a new live shoulder or hip joint, to reconstruct a deformed joint or to restore a pathologically dysplastic and congenitally luxated joint, including: a figured hinge designed to be placed upon the bone close to a provisional joint created by milling; said figured hinge having a spherical knob and a curved guiding

member having a hollow interior in which said spherical knob is located, said hollow interior being of a circular cross section, corresponding to the shape and size of said spherical knob and ensuring restricted rotation of said spherical knob, its position on the rotation axis of the caput in one plane, and of its sliding along said guiding member along an arc with its radius from the rotation axis of the caput in another plane; a curved rod having one end to which said spherical knob is fastened; an expandable connecting turnbuckle having one end connected with a second end of said curved rod; an anchor-like pair of separably crosswise interconnected members, separably and controllably linked with a second end of said expandable connecting turnbuckle and designed to be fixed to the hip-bone or shoulder-bone so as to form there three support areas upon the compact layer of opposite walls inside the bone tube; a second



rod, one end of which is firmly fixed to an outer side of said guiding member; an anchor-like member for fixation to the pelvis or the scapula and clavicula, fixed separably and controllably to a second end of the second rod; said anchor-like fixation member having curved members separably crosswise interconnected, designed for fixation to the pelvis or the scapula and clavicula; as a result of which when fixing the apparatus to the bones forming the joint, the joint ends of the bone are established in a position making possible purposeful active movements within the joint around a definite point or axis, indispensable for the respective joint in accordance with the predeterminate form and function, ensuring the maintenance of a clearance between the faciae articularis as being necessary for their natural congruent and complemental conjunctive growth, coming to term by covering the faciae articularis with support-giving hyaline cartilage.

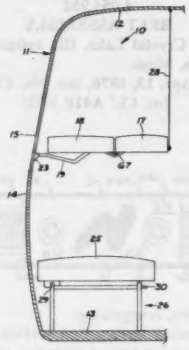
4,054,956

FOLDABLE BUNK BED ASSEMBLY

Howard M. Quakenbush, 308 Maple St., Apple River, Ill. 61001

Filed Aug. 6, 1975, Ser. No. 602,205
Int. Cl.[2] A47C *17/40*
U.S. Cl. 5—9 R **9 Claims**

1. In a folding bunk assembly for installation in an enclosure including a generally vertical wall, a floor and a ceiling, a pair of horizontally spaced arms means each arranged for connection at one end to the wall for pivotal movement about a common horizontal axis close to the wall, said pair of arm means being pivotal between first positions extending downwardly from said axis along the wall to second positions projecting generally horizontally outwardly from said wall, cushion means supported on said pair of arm means to be positioned close to the wall in said first position of said arm means and to project horizontally outwardly from the wall in said second position of said arm means to provide a bed, and vertical support means providing vertical support for said arm and cushion means in said second positions of said arm means, said cushion means including first and second cushion sections and a hinge connection between said first and second cushion sections for providing relative pivotal movement of said first and second cushion sections about a horizontal axis, said first cushion section being positionable between said second cushion section and the wall in said first positions of said arm means and being arranged to project outwardly from said second cushion section in said second positions of said arm means, said vertical



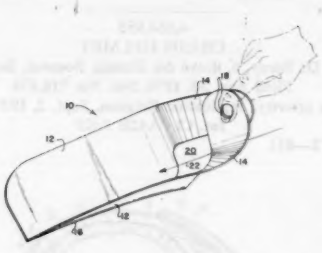
support means being connectable to said first cushion section in said second positions of said arm means, and movement limiting means for limiting relative pivotal movement of said first and second cushion sections to maintain said first and second cushion sections in horizontal alignment in said second positions of said pair of arm means.

4,054,957

USER-FORMED URINATION TROUGH

Harry Diamond, 340 Verona Ave., Elizabeth, N.J. 07208

Filed June 18, 1976, Ser. No. 697,561
Int. Cl.[2] E03D *13/00;* **B65G** *11/02;* **B67C** *11/02*
U.S. Cl. 4—110 **2 Claims**



1. An open-top V-shaped urination trough constituted by a single sheet of flexible material, having a pair of sidewalls extending from a central fold line of said sheet upwardly away from each other, and having a pair of tabs extending from a common end of said walls, respectively, at regions of said walls spaced from said central fold line, each tab being bent to extend upwardly and inwardly of the respective walls into overlapping engagement to define a trough with a hole at one end embraced by said tabs.

4,054,958

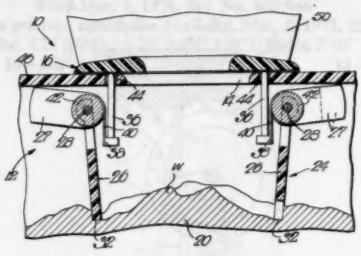
TOILET OF COMPOST TYPE

Ernest G. Widham, 247 Shaw St., New London, Conn. 06320

Filed Jan. 16, 1976, Ser. No. 649,709
Int. Cl.[2] A47K *11/02, 13/00*
U.S. Cl. 4—144 **2 Claims**

1. In a compost toilet, the combination with a longitudinal waste receptacle and a seat with an opening to and centered on the receptacle therebeneath, of a gate in said receptacle providing hinged companion leaves for their swinging movement into

open and closed gate positions, with said leaves having parting sides and being in closed gate position substantially continuous with each other at said parting sides, said parting sides being disposed substantially horizontally and extending longitudinally and substantially midway of said waste receptacle in closed gate position, and said leaves being located in said



receptacle to be in and out of vertical alignment with said seat opening in closed and open gate positions, respectively, with said leaves slanting upwardly to said parting sides in said closed gate position, and having restricted urine leakage paths therethrough scattered in transverse directions within the vertical confines of said seat opening in said closed gate position.

4,054,959

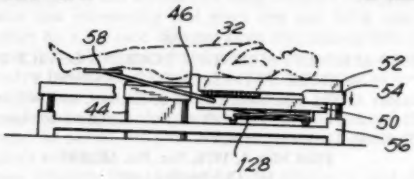
INVALID BED ARRANGEMENT

Paul L. DiMatteo, Huntington, and Henry V. Diaferia, Brentwood, both of N.Y., assignors to Dynell Electronics Corporation, Melville, N.Y.

Continuation-in-part of Ser. No. 544,710, Jan. 28, 1975, Pat. No. 4,016,005. This application May 11, 1976, Ser. No. 685,415

Int. Cl.[2] A61G *7/02*

U.S. Cl. 5—81 R **13 Claims**



1. An apparatus for transferring a person from a reclined position to an upright seated position comprising means for supporting the back side of the person with the person's posterior at a first location; means for raising the calves of the person and bending the knees of said person; means for feeding substantially the posterior of said person, the weight of said person being directed away from said posterior during freeing thereof; means for returning the person to a reclined position and lowering said person onto a seating member so that the posterior of said person is directly in contact with said seating member.

4,054,960

INFLATABLE BODY SUPPORT CUSHION, PARTICULARLY TO SUPPORT A WOMAN DURING PREGNANCY

John E. Pettit, and Dorothy E. Pettit, both of 18219 46th Place South, Seattle, Wash. 98188

Filed June 25, 1976, Ser. No. 699,894

Int. Cl.[2] A61G *07/02*

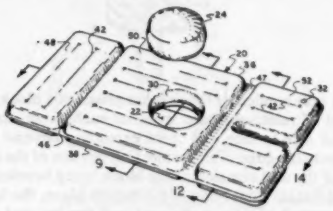
U.S. Cl. 5—357 **1 Claim**

1. A resting support cushion for a pregnant woman, being fully collapsible, which is selectively inflated to degrees of firmness to directly support her throughout her body, except for the indirect support of her expanded abdomen, her enlarged breasts, and her central face, comprising:

a. a continuous surrounding central web portion positioning three otherwise separated inflatable portions of this resting support of full body length;

b. a head supporting inflatable portion at the commencement of the continuous surrounding central web portion having two interconnected inflatable portions spaced apart along a portion of the center line of this resting support, thereby creating a breathing space for a pregnant woman resting in a face down position;

c. a central body supporting inflatable portion positioned by



the continuous surrounding cental web at a reasonably wide transverse spacing from the head supporting inflatable portion, thereby creating a space between them to accommodate the enlarged breasts of a pregnant woman resting in a face down position, and this central body supporting inflatable portion having a circular opening therethrough, thereby creating a space to accommodate the expanded abdomen of a pregnant woman; and

d. a feet and legs supporting inflatable portion positioned by the continuous surrounding central web at a narrow transverse spacing from the central body supporting inflatable portion, thereby completing the overall comfortable resting support of a pregnant woman.

4,054,961

STABILIZING DEVICE FOR AN INFLATABLE RAFT

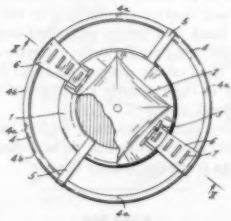
Walter Tangen, Oslo, Norway, assignor to Gewako S.A., Luxembourg Ville, Luxembourg

Filed Oct. 17, 1975, Ser. No. 623,392

Claims priority, application Norway, Oct. 18, 1974, 74.3779

Int. Cl.[2] B63B *7/08*

U.S. Cl. 9—11 A **5 Claims**



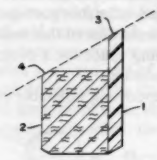
1. An inflatable life raft comprising an inflatable body having a predetermined depth and being capable of floating on a body of water and being of sufficient dimension to support a human being therewithin, an inflatable hose surrounding said body at a spaced distance from the outer circumference thereof, said hose having a depth less than said predetermined depth and likewise being capable of floating on the body of water, pairs of oppositely disposed, flexible straps tightly interconnecting said hose with a top surface of said body whereby said straps each slope toward said hose outwardly of said body.

4,054,962

WAX APPLICATOR FOR SKIS

Robert W. Janke, 820 Kewin St., Altoona, Wis. 54720

Filed Jan. 5, 1976, Ser. No. 645,736
Int. Cl.[2] A63C *11/08*; B05C *17/10*
U.S. Cl. 15—105 1 Claim



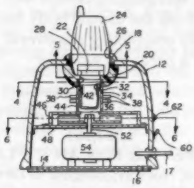
1. A wax applicator for skis comprised of a block of cork and a sheet of relatively hard material such as an acrylic plastic secured face-to-face, the sheet extending beyond one side of the block, the edge of the projecting portion of the sheet and an edge of the said one side of the block being beveled to provide spaced flat surfaces lying in a common plane, the beveled cork edge serving to spread the wax and the beveled edge of the relatively hard material serving to smoothen the same.

4,054,963

ELECTRIC SHAVER HEAD CLEANING DEVICE

Clarence R. Taylor, 28 Woodside Drive, Penfield, N.Y. 14526

Filed Feb. 23, 1976, Ser. No. 660,616
Int. Cl.[2] A47L *7/00*
U.S. Cl. 15—310 7 Claims



6. An electric shaver head cleaning device comprising:
a housing having an opening;
a duct in said housing;
a flexible cup-shaped seat mounted in said opening in said housing and connected to one end of said duct for receiving the head of an electric shaver, the inner periphery of one end of said seat corresponding to the outer shape of the shaver head and being provided with at least one groove for allowing air from the exterior of said housing to enter the head of the shaver, said seat further having a seat opening in the opposite end thereof in register with the shaver head; and
vacuum forming means mounted within said housing and connected to the opposite end of said duct for removing hair clippings from the shaver head.

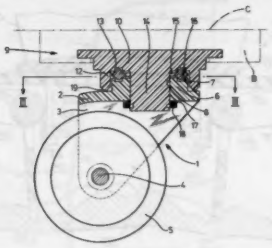
4,054,964

DETACHABLE LUGGAGE CASTER ROLLER

Katsuyoshi Kaneko, Tokyo, Japan, assignor to Maruwa Echo Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1975, Ser. No. 625,877
Int. Cl.[2] B60B *33/00*
U.S. Cl. 16—20 6 Claims

1. A detachable luggage caster roller comprising a base plate formed of synthetic resin, means to secure said base plate detachably to a piece of luggage, the base plate including a cylindrical female member having a sliding surface, a roller support bracket formed of synthetic resin and including a cylindrical male member that extends up into said female member, a post connecting said male and female members for rotation relative to each other about their common axes, said male member including a sliding surface directly or indirectly opposed to and rotatably engaged with said sliding surface of said



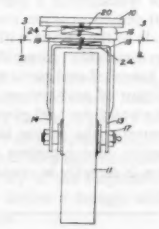
female member through point and line contacts in a thrust or radial direction, and a roller mounted rotatably in said roller support bracket whereby said roller is enabled to freely swivel about said common axis, the axis of rotation of the roller being perpendicular to and spaced from said common axis.

4,054,965

SELF ALIGNING MAGNETIC LOCKING DEVICE FOR MODULE SWIVEL CASTER ASSEMBLY

Satinder K. Vig, Edinboro; Harold J. Koester, and William H. Berg, Jr., both of Erie, all of Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed May 4, 1976, Ser. No. 682,985
Int. Cl.[2] B60B *33/00*
U.S. Cl. 16—35 D 10 Claims

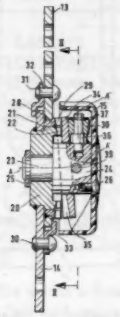


3. A caster comprising,
a fixed member adapted to be supported on a vehicle and
a caster fork having a wheel therein,
pivot means pivotally connecting said fork to said fixed member,
said fixed member having magnetic means producing a magnetic field thereon,
said fork having second magnetic means thereon, adapted to be attracted by said magnetic field, whereby said caster fork is urged to swing to a predetermined position.

4,054,966
LOCKABLE, ADJUSTABLE HINGE FOR MOTOR-VEHICLE SEAT

Ulrich Putsch, Rockenhausen, and Gerd Klingelhöfer, Remscheid, both of Germany, assignors to Keiper K.G., Remscheid-Hasten, Germany

Filed Mar. 1, 1976, Ser. No. 662,846
Claims priority, application Germany, Mar. 1, 1975, 2509074
Int. Cl.[2] E05D *11/10;* **A47C** *1/025;* **B60N** *1/06*
U.S. Cl. 16—143 **13 Claims**



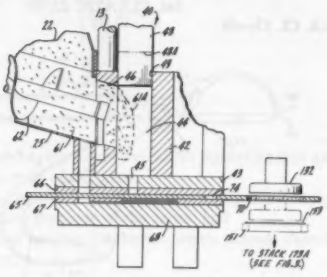
1. An adjustably lockable hinge comprising:
first and second adjacent hinge elements;
a pintle between said elements defining a pivot axis therefor;
a first arcuate row of equispaced first abutments fixed on said first element spaced from and centered on said axis and facing axially in one direction;
a body having a second arcuate row of equispaced second abutments facing axially from said body opposite to said one direction and axially aligned with said first row, said abutments of said second row being centered on a precession axis intersecting said pivot axis and being spaced apart by a distance different from the spacing between said first abutments, whereby said rows can precess and only a limited number of said second abutments can mesh at one time with said first abutments;
means rotationally linking said body with said second element to permit for joint angular movement about said pivot axis; and
means rotatable about said pivot axis relative to said elements and engageable with said body to cause said second abutments to roll on said first abutments to produce precession of said second row on said first row.

4,054,967
FOOD PATTY MOLDING MACHINE

Glenn A. Sandberg, Lockport; Louis R. Richards, Mokena, and James W. Stoub, Oak Forest, all of Ill., assignors to Formax, Inc., Mokena, Ill.

Filed Oct. 20, 1975, Ser. No. 623,986
Int. Cl.[2] A22C *7/00*
U.S. Cl. 17—32 **16 Claims**

1. A food patty molding machine comprising:
a pump housing enclosing a tall, narrow, elongated pump chamber having an outlet port extending longitudinally of one edge of the chamber and an access port extending longitudinally of one side of the chamber, the access port having a height greater than the width of the pump chamber;
a mold plate including a plurality of mold cavities;
a mold plate drive for cyclically moving the mold plate between a fill position, in which the mold cavities are aligned with the outlet port, and a discharge position, in which the mold cavities are displaced from the outlet port, with a dwell interval at each position;
supply means for continuously maintaining a supply of food product completely covering the access port;
a plunger projecting into the pump chamber through the edge opposite the outlet port and movable between an intake position, in which the plunger is displaced from the outlet port to a point clear of the access port, and a range of pressure positions, in which the plunger extends past and completely closes the access port;
plunger drive means driving the plunger to maintain food product under essentially uniform pressure when the plunger is in its pressure position range, the plunger drive means comprising a reversible fluid pressure motor connected to the plunger and fluid pressure means for supplying fluid, under pressure, to the motor;

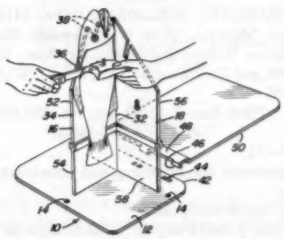


and control means for actuating the plunger drive means through an operating cycle synchronized with the mold plate cycle, moving the plunger from its pressure position range to its intake position and back into its pressure position range during a period in which the mold plate is displaced from its fill position, the plunger moving toward its intake position at a speed sufficient to develop a partial vacuum in the chamber and thereby draw food product from the supply means a short distance through the access port with no appreciable external impetus.

4,054,968
SMALL GAME HOLDER

Wilbert A. Statz, 1913 Skeels Ave., Eau Claire, Wis. 54701

Filed Oct. 22, 1975, Ser. No. 624,936
Int. Cl.[2] A22C *25/00*
U.S. Cl. 17—44.2 **4 Claims**



1. A game holder including an upstanding panel member, said panel member including at least an upper end portion tapering upwardly in width and terminating upwardly in a generally horizontal upper marginal edge portion provided with upwardly projecting teeth spaced therealong, said panel member including a lower portion having support means adapting said panel member to be supported from a stationary support structure, said panel member including upstanding opposite side edges, the upper end portion of one of side edges being inclined upwardly and inwardly toward the other side edge and defining said upwardly tapering upper end portion,

an upstanding plate including upstanding side edges, the other side edge of said panel member being secured to and extending upwardly along one side of said plate centrally intermediate the upstanding side edges thereof with said plate and panel member being disposed at generally right angles relative to each other, said panel member including a horizontal window opening formed in said upper end portion a spaced distance below said upper marginal edge portion.

4,054,969

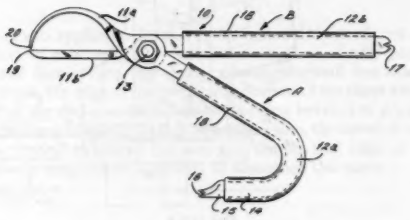
FISHING TOOL

James E. Vogt, 400 Friedens Road, St. Charles, Mo. 63301

Filed Jan. 8, 1976, Ser. No. 647,353

Int. Cl.[2] A22C *25/00*

U.S. Cl. 17—68 **7 Claims**



1. A tool for removing skin from fish comprising

a. first and second members each having jaw and handle portions, and

b. pivot means connecting the two members intermediate the jaw and handle portions,

c. the first of said members having the jaw portion and handle portion in substantial alignment through the pivot,

d. the second of said members having a convexly curved jaw portion with a straight handle portion in substantial alignment and tangent to one end of the convexly curved jaw, the free end of said convexly curved jaw member engaging the free end of the first jaw member,

e. the handle portions being angularly diverging from the pivot whereby a rearward pull on the handles will urge the jaw members together,

f. said jaw members having substantial width to grip the skin of the fish in a substantial linear engagement at the said free ends.

4,054,970

APPARATUS FOR DEHEADING SHRIMP

Shirley Jean Metzger, 2025 S. Parkwood, Harlingen, Tex. 78550; James Walker Smith, 402 Del Mar, Corpus Christi, Tex. 78404, and Juan Castillo Leal, 801 S. "K" St., Harlingen, Tex. 78550

Filed June 7, 1976, Ser. No. 693,440

Int. Cl.[2] A22C *29/02*

U.S. Cl. 17—71 **8 Claims**

1. An apparatus for orienting and dissecting a crustacean comprising:

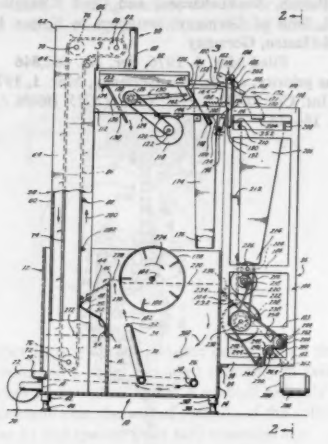
orienting means comprising

at least one passageway of infundibuliform cross-section, said passageway being sized to receive a crustacean at one end, the taper of said infundibuliform passageway being adapted to prevent passage of said first portion of said crustacean's anatomy;

timing means operatively connected to said orienting means for controllable varying the taper of said infundibuliform passageway so the entire body of said crustacean can pass through said passageway after said first portion has been caught; and

dissecting means comprising:

transfer means responsive to said orienting means and said timing means for receiving and controlably manipulating the orientation of said crustacean from the end of said passageway; and



gripping means adapted to receive said crustacean from said transfer means for selectively gripping said first portion of said crustacean and severing said first portion from said body.

4,054,971

CLASPING DEVICE

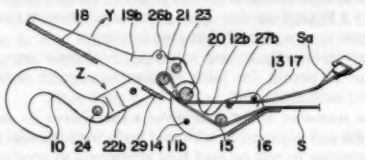
Akira Kawahara, Kagawa, Japan, assignor to Ryusyo Industrial Co., Ltd., Osaka, Japan

Filed June 14, 1976, Ser. No. 695,963

Claims priority, application Japan, July 26, 1975, 50-103613[U]

Int. Cl.[2] B66F *3/00*

U.S. Cl. 24—68 CD **13 Claims**



1. A clasping device comprising:

a body comprised of a pair of plate members connected to each other in a spaced relationship, said pair of plate members having a first end and a second end opposite said first end and said first end having a clearance therethrough;

manipulatable lever means pivotally mounted on said second end of said body for pivotal movement on said body toward and away from said first end of said body, said lever means comprised of a pair of lever members connected to each other in a spaced relationship;

first and second pin members in spaced relation to each other positioned between said spaced plate members, said first pin member positioned through and connecting said lever means to said body;

a third pin member positioned between said spaced lever members;

a flexible strap having first and second ends and extending from said first end through said clearance in said first end of said body, past and in contact with said first pin member, around said third pin member and back past and in contact with said second pin member and back out said

clearance when said manipulatable lever means is pivoted away from said body, said strap between said second and third pin members being turned around said first pin member in contact with said strap portion contacting said first pin member when said lever means is pivoted toward said body; and

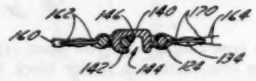
pulling force receiving means pivotally coupled to said manipulatable lever means for receiving an external pulling force acting in a direction substantially counter to the direction of said second end of said strap.

4,054,972

BRASSIERE FASTENER

Ross Fredrick Rowell, 5361 Belmore, Montreal, Canada

Filed Apr. 27, 1976, Ser. No. 680,712
Int. Cl.[2] A44B *13/00*
U.S. Cl. 24—201 HE **1 Claim**



1. A fastener suitable for use in a front fastening brassiere, said fastener comprising first and second fastening members, both formed of a resilient plastic material;

said first fastening member comprising a frame surrounding an elongated aperture adapted to receivve one strap of said brassiere to be passed around a first side of said frame and a first imperforate stiffening flange integral with said first side of said frame, said first stiffening flange being planar and extending outwardly a substantial distnce in the plane of said frame from said first side of said first frame;

said second fastening member comprising a second frame surrounding an elongated aperture adapted to receive a second strap of said brassiere to be passed around a first side of said frame and a second imperforate stiffening flange integral with a first side of said second frame, said second stiffening flange being planar and extending outwardly a substantial distance in the plane of said frame from said first side of said second frame and further including a generally U-shaped hook portion having a first arm thereof integral with a second side of said frame, and a second arm shorter than said first arm terminating in a spaced-apart relationship with respect to said second side of said frame to form a gap therebetween, said gap being sized to be of a width substantially equal to the width of a second side of said first member, said second arm being of a length greater than the aperture width between said first and second sides of said first hook member, both of said stiffening flanges being thinner than the frames with which they are integral and being of a thickness which is penetrable by a means for securing a brassiere strap to each of said stiffening members having an area sufficient to provide a surface for gripping said fastening members between the fingers of a person manipulating said fastener to open or close the same.

4,054,973

SLIDE FASTENER CHAIN WITH WIDE GAP AND METHOD AND APPARATUS FOR MANUFACTURE

George B. Moertel, Conneautville, and James R. Johnston, Meadville, both of Pa., assignors to Textron Inc., Providence, R.I.

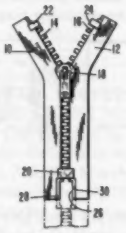
Filed May 24, 1976, Ser. No. 689,415
Int. Cl.[2] A44B *19/02*
U.S. Cl. 24—205 R **15 Claims**

1. A chain for a slide fastener comprising

a pair of textile carrier tapes containing thermoplastic threads,

a pair of rows of interlocking fastening elements secured to inner longitudinal edge portions of the respective tapes,

a gap formed by cutting out a section of the inner longitudinal edge portions and corresponding attached fastening elements including several of the fastening elements of each row,



said carrier tapes having respective bands bordering said gap including the ends of the gap,

said bands of the tapes being reduced in cross section relative to the remaining portions of the tapes, and

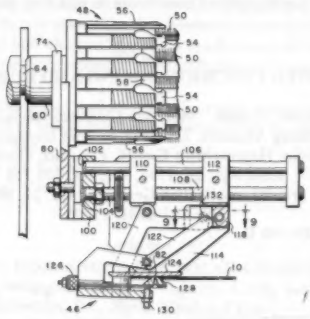
said bands further having the thermoplastic threads therein fused together.

4,054,974

APPARATUS TO MANUFACTURE A CUT LOOP PILE FABRIC HAVING AN IMPROVED SELVEDGE DETECTOR AND GUIDE

Walter Engels, Tryon, N.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 11, 1976, Ser. No. 713,394
Int. Cl.[2] D06C *13/08*
U.S. Cl. 26—9 **3 Claims**



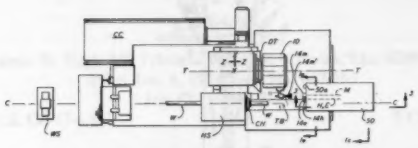
1. Apparatus to provide a cut loop pile fabric comprising: a rotor, a plurality of rows of cutting means in said rotor, means to rotate said rotor, means to supply a loop pile fabric with a selvedge thereon into contact with said rotor with the loops of the fabric in contact with said cutting means, selvedge protection means on at least one end of said rotor between each of said rows of cutting means to hold the selvedge of the fabric out of contact with said cutting means and means operably associated with said apparatus to automatically maintain said selvedge protection means in a predetermined position by sensing the edge of the pile in the fabric when the fabric selvedge is greater than a certain width and sensing the edge of the selvedge of the fabric when the selvedge is less than a predetermined width.

4,054,975

TURRET LATHE APPARATUS

Carl William Lundstrom, 48 Larchmont Road, Binghamton, N.Y. 13903

Filed Mar. 6, 1975, Ser. No. 555,856
Int. Cl.[2] B23B *3/18, 39/20*
U.S. Cl. 29—27 C 40 Claims



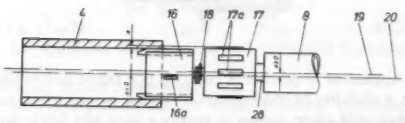
1. In a turret lathe having a machine base, headstock means carried on said base for rotating a workpiece about a first axis, a turret rotatably indexable about a second axis to a plurality of discrete index positions to selectively present successive tools carried on said turret to said workpiece, means for indexing said turret about said second axis, and means for translating said turret relative to said base in a first coordinate direction parallel to said first axis, the combination of: a first detachable power-coupling device carried on said turret and connected to power a first tool carried on said turret, and a power-coupling assembly mounted on said base, said assembly including a second detachable power-coupling device, means for detachably supporting said second detachable power-coupling device in a first predetermined location relative to said maching base, and flexible means for connecting power to said second detachable power-coupling device during movement of said second detachable power-coupling device in said first coordinate direction away from said first predetermined location, said first and second detachable power-coupling devices being adapted to be connected to and disconnected from each other by translation of said turret with said turret in a first one of said index positions to move said first detachable power-coupling device along a first predetermined line to a reference position having a predetermined coordinate in said first direction.

4,054,976

COMBINED PRECISION BORING AND BURNISHING TOOL

Nis-Friedrich Ewald, Monchen-Gladbach-Rheindahler, and Hans-Georg Augustin, Erkelenz, both of Germany, assignors to Wilhelm Hegenscheidt GmbH, Erkelenz, Germany

Filed Apr. 20, 1976, Ser. No. 678,716
Claims priority, application Germany, Apr. 24, 1975, 2518170
Int. Cl.[2] B24B *39/00*
U.S. Cl. 29—90 R 9 Claims



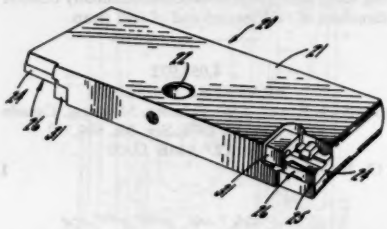
1. A combined tool for precision boring and burnishing of a tubular workpiece comprising, in combination, bore head means; burnishing head means arranged rearwardly of the bore head means; feed tube means for feeding said bore head means and said burnishing head means into a workpiece to be machined; first connection means for rigidly connecting two of the three first-mentioned means substantially aligned along a common axis; and second connection means for transmitting a moment to the third of the three first-mentioned means from at least one of the two other means while permitting limited deviation of said third means relative to said common axis.

4,054,977

BLOCK TYPE CUTTING TOOL WITH POSITIVE CLAMP FOR INSERT BLADES

Harvey R. Plummer, Fond du Lac, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed May 3, 1976, Ser. No. 682,464
Int. Cl.[2] B26D *1/00*
U.S. Cl. 407—108 8 Claims



1. A block type cutting tool with insert type cutter blade comprising in combination, a holder block having a blade receiving pocket with an inclined supporting surface and an upstanding locating surface, an insert type cutter blade having generally parallel upper and lower surfaces and flat sides, a groove in at least one of the parallel surfaces of said blade having a planar floor and upstanding lips, the blade being mounted in the pocket so that one of said parallel surfaces rests on said supporting surface, one of said sides abuts said locating surface and said groove faces upwardly and runs generally parallel to said locating surface, clamp means having a lower surface narrower than said groove and an upstanding shoulder generally parallel to a lip of said groove, said clamp means including adjusting means for drawing the lower surface thereof into engagement with the floor of said groove to progressively wedge the blade into the pocket ultimately bringing said upstanding shoulder into engagement with the lip of said groove, thereby to positively clamp said blade to said locating surface and to provide a perceptible clamping stop.

4,054,978

METHOD FOR REPAIR OF VALVES

John W. Freeman; Thomas M. Jones, and Harold D. Reagan, all of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

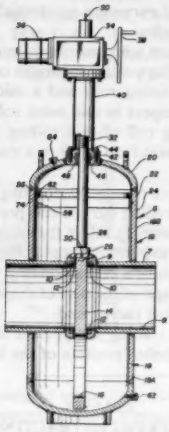
Division of Ser. No. 548,308, Feb. 10, 1975, abandoned. This application May 17, 1976, Ser. No. 687,262
Int. Cl.[2] B23P *7/00, 15/00;* F16K *27/10*
U.S. Cl. 29—157.1 R 3 Claims

1. A method of repairing a valve structure having an upper body portion with a bonnet thereon and a sleeve secured to the inner surface of the upper body portion spaced from said inner surface a predetermined distance; said method comprising the following steps:

first cutting the upper valve body portion about a perimeter laterally spaced from the sleeve to permit removal of an upper bonnet portion from a lower bonnet portion with the sleeve shielding the interior of the valve body from the cutting operation and lapping the upper and lower bonnet portions;

then repairing the defective element; and

thereafter welding the bonnet portions together independent of the sleeve at a position laterally spaced from the sleeve



and with the sleeve shielding the interior of the valve body from the welding operation.

4,054,979

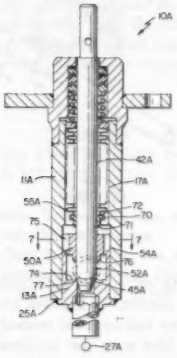
VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Arie F. Massey, Jr., Lenoir City, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 490,589, July 22, 1974, Pat. No. 3,990,680. This application Aug. 19, 1976, Ser. No. 715,927

Int. Cl.[2] B23P *15/00;* **F16K** *27/02*

U.S. Cl. 29—157.1 R **2 Claims**



1. A method of making a valve construction comprising the steps of forming a housing means with an inlet and an outlet interconnected together by a valve seat of said housing means, disposing a movable valve member in said housing means for opening and closing said valve seat, forming said valve member with an elongated and integral valve stem extending from one side thereof whereby said valve member and said valve stem are one-piece, forming said housing means with axially spaced guide means to provide the sole means for guiding axial movement of said valve stem, disposing a guide collar means on said valve stem closely adjacent said valve member to cooperate with one of said guide means of said housing means, forming said guide collar means to extend radially outwardly from said valve stem and be larger than said valve member, forming said guide collar means and said one guide means of said housing means with limiting means that permits axial movement of said guide collar means relative to said one guide means while preventing rotational movement therebetween, forming said limiting means of said guide collar means as a plurality of slots in said guide collar means, forming said limiting means of said one guide means as a plurality of spline members to be respectively received in said slots of said guide collar means, forming said valve seat as a separate valve seat member carried by said housing means, and forming said valve seat member to carry said spline members.

4,054,980

PROCESS FOR MANUFACTURING MODULAR ELEMENTS AND A TUBE NEST FOR HEAT EXCHANGERS

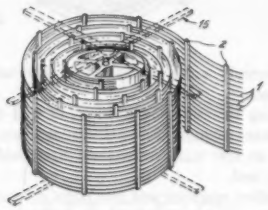
Carlo Roma, Rome, Italy, assignor to Square S.A., Switzerland

Division of Ser. No. 343,196, March 21, 1973, Pat. No. 4,030,540. This application Dec. 2, 1976, Ser. No. 746,892

Claims priority, application Italy, Apr. 20, 1972, 49783/72

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.3 R **10 Claims**



1. A process for making a tubular assembly which forms modular elements for tube nests comprising the steps of:

a. providing a supply of flexible thermoplastic tubes in parallel alignment;

b. pulling the thermoplastic tubes from the supply;

c. spacing the thermoplastic tubes a uniform distance from one another;

d. providing in guide means a supply of upper half element spacers to one side of the thermoplastic tubes and a supply of lower half element spacers in guide means to the other side of the thermoplastic tubes, said spacers having seating grooves;

e. mating the upper and lower half element spacers so as to capture and space the thermoplastic tubes in the seating grooves; and

f. winding the tubing assembly of thermoplastic tubes with spacers in a roll.

4,054,981

HEAT EXCHANGER FOR SOLAR ENERGY

James Earl Bridgegum, Canyon Country, Calif., assignor to Mor-Flo Industries, Inc., Santa Monica, Calif.

Division of Ser. No. 677,748, April 16, 1976, abandoned. This application Feb. 17, 1977, Ser. No. 769,413

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.3 R **2 Claims**

1. A method of manufacturing a heat exchanger for solar energy wherein heat is exchanged between a solar heated fluid and water in a cylindrical storage tank, including the steps of:

a. wrapping a sheet of metal around said cylindrical storage tank;

b. drawing the left and right sides of the sheet past each other in overlapping relationship so that said sheet snugly engages the tank but still defines a narrow annular space between the inner wall surface of said sheet and the exterior of said tank;

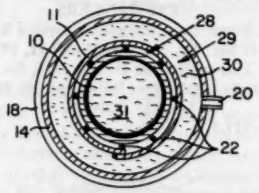
c. welding the overlapped portions of said sheet in a continu-

ous weld along a direction parallel to the axis of said cylindrical storage tank;

d. spot welding portions of the sheet adjacent to opposite ends of the tank to said tank at circumferentially spaced points so that there is communication between said narrow annular space and the exterior between said spot welds;

e. surrounding said sheet with an outer cylinder;

f. rolling the opposite ends of said outer cylinder to taper the diameter of the safe to fully engage over 360° the outer surface of said sheet adjacent to said opposite ends of said outer cylinder to define with the outer wall of said sheet a



substantially wider annular space than said narrow annular space;

g. welding the engaging portions of said opposite ends of said outer cylinder over 360° to said outer surface of said sheet to seal and render fluid tight said wider annular space; and,

h. providing entrance and exit ports for said wider annular space so that said solar heated fluid can be circulated therethrough to heat water in said tank, any leaks in the inner wall defining said wider annular space resulting in said heated fluid passing to the exterior through said narrow annular space so that the risk of contamination of said water in said tank by said heated fluid is minimized.

4,054,982

METHOD OF FORMING CIRCULARLY BENT ARTICLES, IN PARTICULAR WHEEL RIMS, FROM A STRAIGHT METAL PROFILE STRIP AND APPARATUS FOR PERFORMING THE METHOD

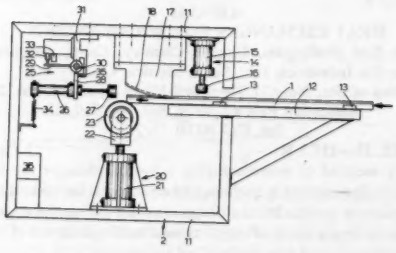
Cornelis Christiaan Damman, Diemen, Netherlands, assignor to Holland Mechanics B.V., Diemen, Netherlands

Filed Nov. 17, 1976, Ser. No. 742,679

Claims priority, application Netherlands, Nov. 21, 1975, 7513654; Mar. 12, 1976, 7602645

Int. Cl.² B21H *1/06;* B21K *1/04;* B21D *5/01, 7/14*

U.S. Cl. 29—159.1 **6 Claims**



1. A method of forming circularly bent ring members from elongated metal profiled strip material, particularly for making rims of spoke wheels, such as bicycle wheels, comprising the steps of

cutting from said strip material strip pieces of a length equal to the circumferential length corresponding to the selected radius of the ring member to be formed;

forming at each end of said strip pieces a curved end portion having a radius of curvature substantially corresponding to said selected radius;

feeding said strip piece with one of said curved end portions into a three-roll ring rolling apparatus of the type including two outer forming rolls and a middle forming roll adjustable with respect to said outer rolls,

said middle forming roll of said rolling apparatus having been set to bend said strip piece to a ring of said selected radius;

passing said strip piece through said rolling apparatus at least up to the other, trailing curved end portion thereof; and

shifting the middle forming roll of the rolling apparatus from said set position towards the outer forming rolls into a predetermined position corresponding to a substantially bending-free passage of the part of the strip piece already bent to said selected radius; and

passing said curved trailing end portion through said forming rolls in said shifted position of the latter.

4,054,983

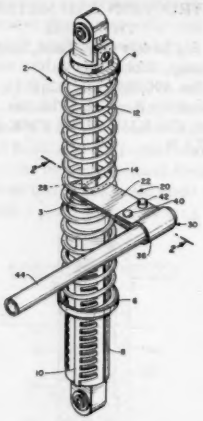
HELICAL SPRING RETRACTING TOOL

Arnold Cowan, 5330 Yarmouth Ave., Apt. 112, Encino, Calif. 91316

Filed May 20, 1976, Ser. No. 688,160

Int. Cl.² B23P *19/04*

U.S. Cl. 29—227 **5 Claims**



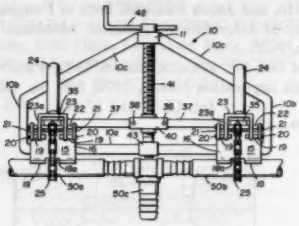
1. A helical spring retracting tool comprising a laterally extending plate-like member of uniform cross-sectional thickness having a first end and opposed second end, said first end having a U-shaped slot near the terminus thereof, said U-shaped slot being oriented substantially perpendicular to the longitudinal axis of said plate-like member and adapted to receivably accommodate in retained position a shaft or the like and integral, curvilinear-configured knuckle means on said end for receiving a leverage handle whereby said plate-like member may be rotated about an axis lying in said U-shaped slot intermediate adjacent windings of a helical spring to thereby compress or decompress said helical spring, the thickness of said plate-like member being sufficient to carry relatively heavy loads subjected upon it during the helical spring compression; and a handle member carried by said means on said second end for receiving a leverage handle, said integral, curvilinear-configured knuckle means for receiving a leverage handle being an integral knuckle-like member having opposed lateral plate sections and being pivotally secured to said plate-like member.

4,054,984

TOOL FOR JOINING AND SEPARATING PLASTIC PIPE JOINTS

Dorothy P. Ball, 1101 W. Second St., Ottumwa, Iowa 52501, and Charles E. Ball, 1630 G Ave., Fort Madison, Iowa 52617

Filed Dec. 30, 1976, Ser. No. 755,731
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—237 **5 Claims**



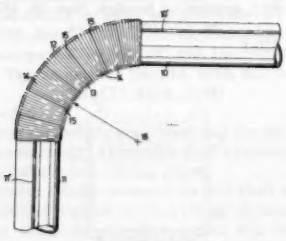
1. A tool for joining or separating plastic pipe sections comprising: an open, generally planar frame bounded by perimeter defining members including a rectilinear member; a pair of clamp members attached to and slidable toward and away from each other on the rectilinear frame member, each of the clamp members having means to releasable secure pipe sections thereto outside of the frame perimeter but in axial alignment with each other and parallel to the rectilinear frame member; and a toggle linkage, the toggle linkage including a pair of toggle bars pivotally connected at corresponding ends to respective ones of the clamp members and at their other corresponding ends to opposite ends of a toggle block, the toggle bars and block being disposed within the frame perimeter and all of said pivotal connections providing for movement of the toggle bars and block in the plane of the frame, the toggle block having an internally threaded bore between said pivotal connections thereto whose axis is normal to the rectilinear frame member and intersects the same between the clamp members, and an externally threaded crankshaft rotatably carried in the frame and located against axial movement relative thereto, the shaft threadedly engaging the toggle block bore.

4,054,985

METHOD FOR THE APPLICATION OF A PROTECTION COVER AROUND HEAT OR COOL INSULATED TUBE BENDS

Sven Goran Aleniusson, Valberg, Sweden, assignor to Isolerings Aktiebolaget Isenta, Orebor, Sweden

Filed June 3, 1976, Ser. No. 692,377
Claims priority, application Sweden, June 30, 1975, 7507466
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—416 **13 Claims**



1. A method of applying a protective covering around insulated pipe bends comprising the steps of:

providing a protective tube made from a spirally wound, band-form material, each turn of the spirally wound, band-form material being secured to an adjacent turn by a self-binding lap and being corrugated by at least one corrugation wave running in the longitudinal direction of the band-form material forming said turn;

cutting said protective tube along its length to form at least two parts;

shaping said protective tube to conform to the shape of an insulated pipe bend;

positioning said two parts of said protective tube around said insulated tube bend with the cut edges thereof in adjacency; and

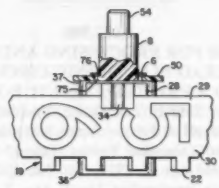
joining together said cut edges to form a protective covering around said insulated pipe bend.

4,054,986

METHOD OF MOUNTING A WHEEL RETAINING RING ON A WHEEL SUPPORT SHAFT

George Marres, Riverton, and Loreto B. D'Alesandris, West Hartford, both of Conn., assignors to Veeder Industries, Inc., Hartford, Conn.

Filed Aug. 23, 1976, Ser. No. 716,590
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—434 **8 Claims**



1. A method of mounting a grip ring at a selected axial position along one generally cylindrical end section of a wheel support shaft of a wheel and shaft assembly comprising a said wheel support shaft, a bank of coaxial wheels mounted on the shaft for rotatable and axial movement thereon, and retaining means at the other end of the shaft for limiting the axial movement of the bank of wheels thereon in one axial direction, the grip ring being mounted on said one generally cylindrical end section of the shaft for limiting the axial movement of the bank of wheels thereon in the opposite axial direction and at a selected axial position along said one end section establishing a predetermined axial play of the bank of wheels thereon, comprising the steps of providing a said wheel and shaft assembly having a wheel support shaft of thermoplastic material at least at said one end section thereof, providing a radially expandable metal grip ring having an internal opening with the ring unexpanded which is slightly less than the diameter of said one generally cylindrical end section of the shaft, inserting the metal grip ring at a selected axial position along said one end section of the shaft establishing said predetermined axial play and with the metal grip ring expanded by the shaft and the ring firmly engaging the shaft, and heating the metal grip ring for heat softening a peripheral portion of the thermoplastic shaft material engaged by the metal grip ring sufficiently to permit the grip ring to contract into the heat softened peripheral portion of the shaft and positively lock the grip ring to the shaft at said selected axial position.

4,054,987

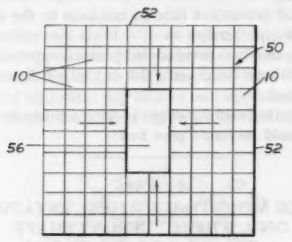
CONSTRUCTION METHOD

Nicholas G. Forlenza, Utica, N.Y., assignor to Mateflex/Mele Corporation, Utica, N.Y.

Filed Feb. 26, 1976, Ser. No. 661,725
Int. Cl.[2] B21D *39/00*
U.S. Cl. 29—452 **2 Claims**

1. In the method of constructing a recreational, ball-playing court surface from a plurality of square, unitary, elastic,

molded thermoplastic sheets having a plurality of support legs on the lower side thereof and means for interlocking said sheets together, disposed about the periphery of said sheets, said sheets being divided into secondary squares comprising gratings defining a plurality of square shaped openings through



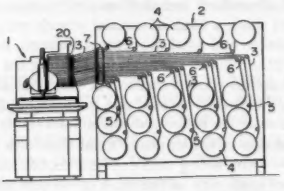
said sheets, which comprises; interlocking said sheets together to form said court surface and anchoring the periphery of the surface formed to an underlying support surface, the improvement which comprises; tensioning said surface along its horizontal axes.

4,054,988

MACHINE FOR PROCESSING AND SECURING PARALLEL LEAD ELECTRONIC CIRCUIT ELEMENTS TO A PRINTED CIRCUIT BOARD

Sho Masuzima; Tetsuo Takahashi; Yoshinobu Taguchi, and Hisashi Fujita, all of Tokyo, Japan, assignors to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1976, Ser. No. 672,944
Claims priority, application Japan, Apr. 2, 1975, 50-39949
Int. Cl.[2] H05K *3/30*
U.S. Cl. 29—564.6 **22 Claims**



1. A machine for processing and inserting parallel lead circuit elements into lead receiving openings in a circuit substrate comprising in combination;

supply means for selectively supplying one group of a plurality of distinct groups of parallel lead circuit elements to appropriate circuit element selection means and circuit element selection means for selecting one of said circuit elements from said selected group of circuit elements supplied thereto by said supply means;

transfer means for receiving from said circuit element selection means each circuit element selected thereby and for displacing same to a release position, said transfer means including chuck means for gripping said selected and supplied circuit element during receipt and displacement thereof to said release position;

insert means including release means operatively disposed to engage said chuck means and effect release of said circuit element gripped thereby when said chuck means is displaced to said release position, and plunger means adapted to engage said circuit element at said release position and displace said circuit element from said release position to an inserted position; and

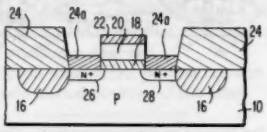
board handling means for disposing said lead receiving openings in said circuit substrate in alignment with said circuit element so that said parallel leads of said respective circuit elements are received in said receiving openings when same are displaced to said inserted position.

4,054,989

HIGH RELIABILITY, LOW LEAKAGE, SELF-ALIGNED SILICON GATE FET AND METHOD OF FABRICATING SAME

Irving T. Ho, and Jacob Riseman, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 521,423, Nov. 6, 1974, Pat. No. 3,943,542.
This application Nov. 6, 1975, Ser. No. 629,446
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **4 Claims**



1. A method of fabricating a field effect transistor comprising the steps of:

a. forming a thin layer of oxide on a wafer of monocrystalline silicon,

b. depositing a layer of conductive polycrystalline silicon on said thin layer of oxide,

c. forming a layer of silicon nitride on said polycrystalline layer,

d. within at least the area of said wafer where said field effect transistor is to be fabricated, removing portions of said silicon nitride layer to form a silicon nitride mask over said polysilicon layer, said mask in said area covering only the region to be the gate structure of said field effect transistor,

e. oxidizing all said polysilicon layer not covered by said silicon nitride mask to form a thick oxide layer thicker than said polysilicon layer,

f. opening holes within said thick oxide layer on opposite sides of said gate structure,

g. introducing impurities into the surface of said monocrystalline silicon layer exposed by said openings to form the drain and source regions of said field effect transistor, and

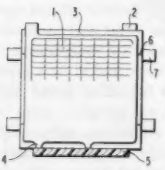
h. forming conductive contacts to said source and drain regions.

4,054,990

METHOD OF ARRANGING ELECTRODES OF STORAGE BATTERIES

Anders Borjesson, Alvangen, Sweden, assignor to Aktiebolaget Tudor, Sundbyberg, Sweden

Filed Oct. 15, 1976, Ser. No. 733,025
Claims priority, application Sweden, Nov. 16, 1975, 7511594
Int. Cl.[2] H01M *2/14*
U.S. Cl. 29—623.1 **4 Claims**



1. A method for arranging the electrodes of an electrode set in the assemblage of an electric storage battery, comprising the

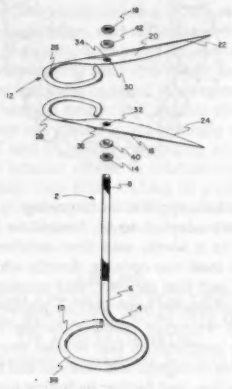
steps of providing an electrode set which contains at least one positive electrode and at least one negative electrode and at least one separator for separating the electrodes, and inserting cutting edges into said separator such that said cutting edges cut into said separator and contact said electrodes to locate said electrodes in predetermined position relative to said separator.

4,054,991

ADJUSTABLE HAIR-CLIPPING DEVICES

William J. Bahr, 1702 Ohio, Lawrence, Kans. 66044

Filed May 20, 1976, Ser. No. 688,308
Int. Cl.[2] B26B *13/24*
U.S. Cl. 30—231 **5 Claims**



1. An adjustable hair clipping device comprising a curved base and a support member, said support member including means for positioning a cutting member a predetermined distance from said base, and a cutting member affixed to said support member at said predetermined position; and wherein said support member comprises a threaded shaft and said cutting member includes an internally threaded aperture by means of which said cutting member is affixed at said predetermined position; and wherein said cutting member is a pair of scissors and said aperture extends through each of the opposing blades of said scissors at the point where said blades are pivoted together; and wherein one end of said shaft has a looped configuration and forms said base.

4,054,992

ROTARY CUTTING ASSEMBLY

George C. Ballas, and Thomas N. Geist, both of Houston, Tex., assignors to Weed Eater, Inc., Houston, Tex.

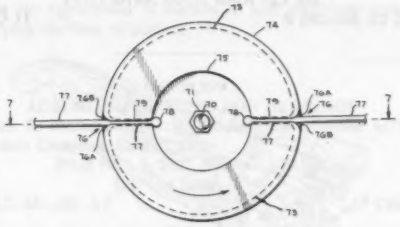
Continuation of Ser. No. 474,713, May 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 347,997, April 5, 1973, Pat. No. 3,859,776, which is a continuation-in-part of Ser. No. 352,580, Jan. 8, 1973, Pat. No. 3,826,068, which is a continuation-in-part of Ser. No. 207,198, Dec. 31, 1971, Pat. No. 3,708,967. This application Dec. 18, 1975, Ser. No. 641,969
Int. Cl.[2] B26B *27/00*
U.S. Cl. 30—276 **17 Claims**

1. Apparatus for cutting vegetation and the like comprising

driving means having a rotatable shaft extending therefrom perpendicularly to a cutting plane,

a head member fixedly mounted on said shaft and having a recess located therein to provide an opening extending inwardly from one side thereof and said head member further having at least one peripheral aperture providing in part a passageway communicating with said recess and said passageway residing within said head member,

at least one non-metallic flexible line member slidably received in close confinement within the passageway and extending from said recess radially outwardly and at least partially across said head member and through said peripheral aperture into said cutting plane, and



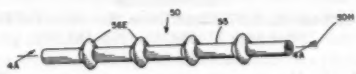
means on said head member for securing said line member against slidable movement from said aperture into the cutting plane but permitting selective withdrawal of said line member from said aperture.

4,054,993

ROTARY CUTTING ASSEMBLY HAVING NOVEL FLAIL

Walter B. Kamp, 206 Bellevue Blvd. South; Richard L. Kimmel, 1403 Lawrence Lane,, both of Bellevue, Nebr. 68005, and Alvin L. P. Aasgaard, III, 3623 Armbrust, Omaha, Nebr. 68124

Filed Sept. 20, 1976, Ser. No. 724,287
Int. Cl.[2] B26B *7/00*
U.S. Cl. 30—276 **8 Claims**



1. Rotary cutting assembly for cutting vegetation with a rapidly whirling flail and comprising:

A. an elongate lineal shaft extending along a vertical-axis, the shaft having a bottom-end and a top-end, said shaft being powerably rotatable about its vertical-axis;

B. A base-plate co-rotatably associated with the shaft and located nearer the shaft bottom-end, said base-plate including a peripheral-edge lying within a horizontal plane and with the shaft vertical-axis at the substantial geometric center of the base-plate; and

C. at least one retainer means attached to the base-plate for removably securing a flail to the base-plate, said at least one retainer being located nearer the base-plate peripheral-edge than to the shaft vertical axis; and

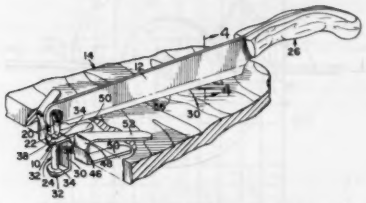
D. An elongate horizontal flexible flail extending along a horizontal-axis extending radially outwardly from the shaft and continuing through the retainer means, said flail being wholly singularly constructed of tough resinous material and which comprises a central-core extending along the flail horizontal-axis, the flail also having an elongate external-contour surrounding the central-core and which flail external-contour is of regularly periodically varying cross-sectional size and shape along the entire flail length to provide numerous protuberances at regular intervals therealong, said multi-protuberances flail promoting efficaceous vegetation cutting action as said horizontal flail rotates about the shaft vertical-axis.

4,054,994

KNIFE AND BREAD BOARD ATTACHMENT

Milton J. Grossman, 10296 S. Mina, Whittier, Calif. 90605

Filed June 23, 1976, Ser. No. 699,063
Int. Cl.[2] B26B *11/00*; A47G *21/14*
U.S. Cl. 30—296 R 11 Claims



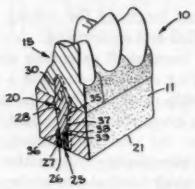
1. A knife and bread board attachment comprising:
a clamping device for attachment to a board, said clamping device having an upper and lower clamping means for receiving an edge portion of a board therebetween;
a knife having a blade; pivot means for pivotly connecting the forward end of the knife blade to said clamping device for vertical pivotal movements of said knife;
said means pivotly connecting the forward end of the knife blade to the clamping device is a horizontal pivot;
a vertical pivot for the clamping device carrying the horizontal pivot, whereby the knife blade may be swung horizontally as well as vertically;
and the upper parts of this clamping means comprises a pair of upper arms, the inner facing edges of said arms being laterally spaced apart and between which the lower sharpened edge of the knife may move into a position closely adjacent the surface of a board to which the device is attached.

4,054,995

PIN WITH SLEEVE FOR MAKING DENTAL PROSTHESIS

Harry Y. Yoshida, 5267 Eileen Drive, San Jose, Calif. 95129

Filed May 3, 1976, Ser. No. 682,202
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—11 25 Claims



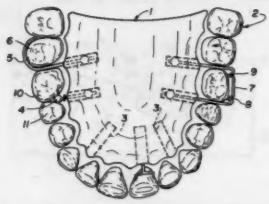
1. A dental prosthesis comprising:
a. a model;
b. a die removably positioned in said model;
c. a pin comprising:
1. a stem embedded in said die; and
2. a shank extending from said stem and projecting out of said die, said shank having a longer portion and a shorter portion defining a shoulder and a tip at the lower extremity of said shank;
d. a base supporting said model, said base being formed with a first wall confronting said die against which said die is disposed, said base being formed with an opening to receive said longer and shorter portions of said shank of said pin; and
e. a sleeve disposed in said base, said sleeve being formed with a bore therethrough aligned with said opening in said base in which to dispose the tip of the longer portion of said shank of said pin to provide a receptacle for the tip of said shank, said sleeve being formed with a first wall confronting said die and surrounding said bore against which said shoulder of said shank of said pin abuts to limit the extent of the insertion of said shank into said base said sleeve extending only along entire length of said tip.

4,054,996

ORTHODONTIC APPLIANCE HAVING REPLACEABLE TOOTH ENGAGING MEMBER

Melvin Wallshein, 8645 Bay Parkway, Brooklyn, N.Y. 11214

Filed July 26, 1976, Ser. No. 708,305
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—14 B 30 Claims



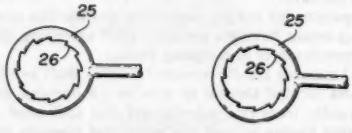
1. An orthodontic appliance comprising:
a first member adapted to be located in a mouth and in proximity to a tooth, said first member having means defining at least one opening therein which opens to the interior of said first member, said opening having a resilient and deformable inner surface portion;
an elongated wire-type member having at least one end removably insertable in said at least one opening of said first member to engage said resilient and deformable inner surface portion, and further including means for cooperatively coupling same to at least one tooth;
said at least one end of said elongated member having a contoured releasable cooperative engaging means for resiliently deforming said resilient and deformable inner surface portion of said opening defining means so that said resilient and deformable inner surface portion substantially conforms to at least a portion of the contour of said engaging means for lockingly and non-rotatably engaging said elongated wire-type member in said opening, whereby upon application of a removal force greater than the locking engaging force, said elongated wire-type member may be removed from said at least one opening to permit insertion of another elongated wire-type member therein.

4,054,997

ORTHODONTIC ELASTIC APPLIANCE

Melvin Wallshein, 8645 Bay Parkway, Brooklyn, N.Y. 11214

Continuation of Ser. No. 629,918, Nov. 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 566,752, April 10, 1975, which is a continuation-in-part of Ser. No. 310,574, Nov. 29, 1974, Pat. No. 3,879,850. This application Sept. 2, 1976, Ser. No. 719,829
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—14 A 92 Claims



1. An orthodontic elastic appliance for use with orthodontic bracket means mountable on teeth, said bracket means defining an opening of predetermined cross-sectional dimension

adapted to receive at least a portion of the orthodontic elastic appliance therein, the bracket opening defined by at least one of said bracket means having at least one engaging and retaining surface adjacent thereto,

said elastic appliance comprising:

a plurality of closed loops of elastic material;

at least one of the said elastic closed loops being adapted to at least partially pass through at least a portion of an opening of a bracket means and be mounted on the bracket means;

elastic connecting means coupled between adjacent closed loops for applying a force to said at least one elastic closed loop relative to a bracket means on which said at least one elastic loop is mounted, said force having a rotational component at least in the plane of said at least one elastic closed loop; and

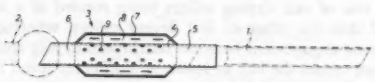
at least one protuberance extending from a surface of at least one of said elastic loops, said at least one protuberance and said at least one elastic loop being dimensioned and shaped such that when said at least one elastic loop is stretched and is at least partially engaged in an opening defined by one of said bracket means, said at least one protuberance of said at least one elastic loop abuttingly engages at least a portion of said at least one engaging and retaining surface of said bracket means to substantially prevent said engaged elastic loop from shifting its position relative to the bracket means on which it is mounted under the influence of said rotational component of said applied force.

4,054,998

METHOD AND APPARATUS FOR DISINFECTING FLUID MEDIUM REMOVED FROM THE ORAL CAVITY OF A HUMAN BEING

Sven-Gunnar Hesselgren, Angsholmen, S-170 11 Drottningholm, Sweden

Filed May 12, 1975, Ser. No. 576,868
Claims priority, application Sweden, May 21, 1974, 7406728
Int. Cl.[2] A61C *17/04;* A61L *1/00, 3/00*
U.S. Cl. 32—33 **10 Claims**



1. A method for continuously disinfecting a fluid medium, removed from the infectious area defined by the oral cavity of a human being comprising the steps of withdrawing said fluid medium as a flowing aerosol in a path from said infectious area under suction directly past a treatment zone, locating a treatment composition containing at least a microbiocidal substance within said treatment zone, said treatment composition being arranged about the periphery of said flow path of said aerosol in communication with said flowing aerosol without impeding the withdrawal of said fluid medium under suction or modifying the flow of aerosol, said suction acting to cause withdrawal of said microbiocidal substance from said composition and subsequent contact of said microbiocidal substance with said aerosol.

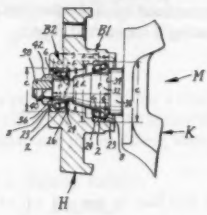
5. Apparatus for continuously removing and disinfecting the infectious fluid medium from an infectious area defined by the oral cavity of a human being, comprising an axially open flow through tube, connection means at one end of said tube connected to means for insertion into and contact with the infectious area for the removal of said infectious fluid medium therefrom, means at the other end of said tube for connection to a source of suction, and a source of suction for removing said fluid medium in the form of a flowing aerosol, said tube being perforated along a section between its ends, said perforated section being surrounded by an enclosed housing secured at its ends to said tube, a treatment composition containing at least a microbiocidal substance arranged within said housing about the outer peripheral surface of said tube free of the flow path of said aerosol, said composition to be subjected to a suction to release said microbiocidal substance through said perforations in contact with the flowing aerosol without impeding the application of suction to said infectious area or modifying the flow of aerosol.

4,054,999

ADJUSTING PROCESS FOR BEARINGS

William E. Harbottle, North Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Nov. 3, 1975, Ser. No. 628,509
Int. Cl.[2] B23P *11/00*
U.S. Cl. 33—181 AT **17 Claims**



1. A process for assembling a bearing assembly capable of being used to mount a shaft within a housing, the assembled bearing assembly including an outer race in the housing and having inwardly presented raceways, a pair of inner races around the shaft and having outwardly presented raceways located opposite the raceways of the outer race, and rolling elements arranged in two rows between the raceways of the inner and outer races, the inner races being clamped together in fixed and determined relation with respect to each other in the axial direction and having front faces, the raceways of the inner and outer races and the rolling elements all being configured to enable the bearing assembly to take axial thrust loading as well as radial loading, said process comprising: measuring the spacing between the raceways of a plurality of outer races; measuring the axial location of the front faces of a plurality of inner races, each with respect to the outer surfaces of the rolling elements surrounding that inner race when the rolling elements are seated against the raceway of that inner race, the measurements of the inner races being conducted outside the outer races; and selecting from the plurality of measured inner and outer races a single outer race and two inner races, the measured front face locations of the selected inner races being such in relation to the measured spacing of the selected outer race that when inner races are inserted into the outer race and clamped together in the fixed and determined relation, a predetermined adjustment will exist in terms of end play or preload.

4,055,000

UNDERWATER SIGHT FOR A SPEAR GUN OR THE LIKE

Louie P. Cesin, 6220 SW. 20, Miami, Fla. 33155

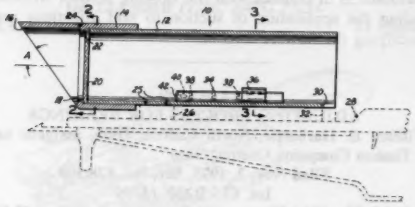
Filed Apr. 28, 1976, Ser. No. 680,997
Int. Cl.[2] F41G *1/46, 1/34*
U.S. Cl. 33—241 **1 Claim**

1. An underwater sight for a spear gun, or the like, comprising:

an elongated tube having forward and rearward open ends and having means including sockets in its wall for connection with a spear gun;

a transparent wall transversely dividing said tube adjacent one end portion for excluding water from the other end portion of said tube when said one end portion is immersed, the end surface of the immersed end of said tube being inclined at an acute angle with respect to the longi-

tudinal axis of the tube, said tube having a bleed hole in its walls adjacent and in front of said partition; and,



lamp means contained by said other end portion of said tube for illuminating a submersed target.

4,055,001

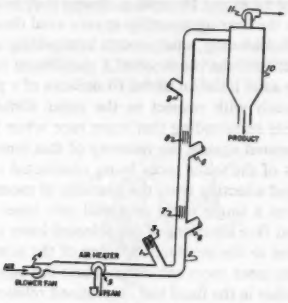
MICROWAVE DRYING PROCESS FOR SYNTHETIC POLYMERS

Eric O. Forster, Scotch Plains, and Peter J. Creighton, Mendham, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 200,257, Nov. 18, 1971, Pat. No. 3,977,089, which is a division of Ser. No. 9,247, Sept. 9, 1969, Pat. No. 3,771,234. This application Sept. 25, 1975, Ser. No. 616,773

Int. Cl.² F26B *3/34, 7/00*

U.S. Cl. 34—1 **2 Claims**



1. In a process for preparing butyl rubber wherein a slurry of said rubber is formed in a diluent from which said rubber is separated by introducing said slurry into water, thereby forming a water slurry of butyl rubber, the steps which comprise:

a. separating the rubber crumb from the water;

b. reducing the water content of said crumb by mechanically dewatering, to about 6 to about 30 wt. %;

c. transferring the dewatered crumb to a first transfer line resonating cavity operating at a frequency of 915 MHZ;

d. conveying said crumb through said transfer line for a period of time sufficient to reduce the water content of the crumb to below 5 wt. %;

e. transferring the partially dried crumb to a second transfer line resonating cavity operating at a microwave frequency of 2450 MHZ; and

f. conveying said crumb through said transfer line for a period of time sufficient to reduce the water content below 5000 ppm.

4,055,002

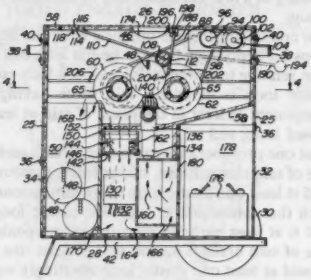
PORTABLE FOOTBALL DRYER

David M. Roberts, 1713 Robinhood Lane, and James A. Sever, 918 University Drive, both of Clearwater, Fla. 33516

Filed June 7, 1976, Ser. No. 693,674

Int. Cl.² F26B *25/00*

U.S. Cl. 34—104 **12 Claims**



1. Apparatus for drying a wet football comprising a housing having a storage chamber for holding dried footballs therein, a drying chamber for receipt of a wet football, said drying chamber having a door to provide access to its interior and including a pair of drying rollers, a stabilizing roller and ejection means disposed within said drying chamber, each of said drying rollers having a concave, peripheral, moisture absorbing surface, said drying rollers being disposed parallel to each other and spaced by a sufficient distance such that a football can be placed within the space therebetween and and supported by said rollers, said stabilizing roller being disposed over said drying rollers and being pivotable from a retracted position enabling the football to be inserted within the space between the drying rollers when said door is open to a biased position to hold the football in said space when said door is closed, said rollers being rotated in the same direction by rotation means, with one of said drying rollers being rotated at a different speed than the other of said drying rollers, whereupon the frictional engagement between one of said drying rollers and the ball causes the ball to rotate at a different speed than the speed of rotation of the other of said drying rollers to effect a rubbing action between the ball and the other of said drying rollers, thereby wiping the surface of said ball, said ejection serving to remove the football from the space between said drying rollers after it has dried and for causing the dried football to be inserted into the storage means.

4,055,003

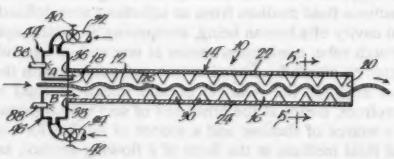
METHOD AND APPARATUS FOR ALTERING THE RIGIDITY OF WEBS BY OSCILLATION

Georges H. Sack, Lisle, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Aug. 28, 1975, Ser. No. 608,426

Int. Cl.² F26B *13/20*

U.S. Cl. 34—155 **16 Claims**



1. Apparatus suitable for treating a flexible web segment by oscillation so as to modify the properties of said segment which comprises

wall means defining an elongated tunnel adapted to receive a web segment having at least two substantially opposing wall surfaces, and having an inlet end and an outlet end;

an array of spaced baffles positioned substantially transversely in said tunnel along each of said opposing wall surfaces;

first and second gas feed means only at said inlet end for introducing a pair of substantially concurrent gas streams into said tunnel;

said baffles in one array being positioned in a staggered relationship relative to the baffles in the other array, and said gas feed means being positioned to impinge a first gas stream against said one array and to impinge a second gas stream against said other array, said baffles deflecting the respective gas streams against said web segment such that said first gas stream deflects said web segment in a first direction and said second gas stream deflects said web segment in the opposite direction, with said web segment being alternately deflected in said opposite directions to oscillate the web segment with a severity and frequency sufficient to mechanically alter the properties thereof; and

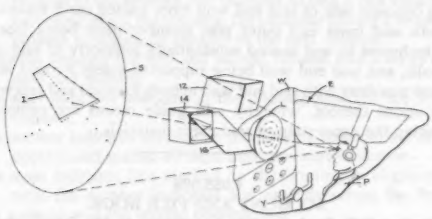
web feeding means for feeding said web segment through said apparatus between said opposing wall surfaces, said feeding means comprising said pair of gas streams.

4,055,004

FULL COLOR HYBRID DISPLAY FOR AIRCRAFT SIMULATORS

Wendell D. Chase, Saratoga, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 17, 1975, Ser. No. 623,536
Int. Cl.² G09B *9/08*; H04N *7/18*
U.S. Cl. 35—12 N **7 Claims**



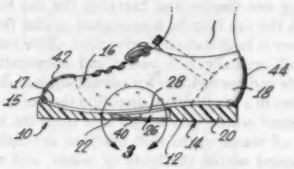
1. Apparatus for visually simulating to a pilot trainee a representation of an aircraft landing site having a number of light sources, said representation being in full-spectrum color, said apparatus comprising a color TV monitor; means connected to said monitor for producing an image on said monitor representative of said site; a cathode ray tube having a range of light intensity exceeding the range of light intensity of said color TV monitor by at least an order of magnitude; means connected to said cathode ray tube for generating a digital calligraphic monochromatic image representative of said light sources; means for converting said monochromatic calligraphic image to a full-color spectrum calligraphic image; said last means comprising a color wheel adjacent the face of said cathode ray tube having three transparent sector-shaped elements of different colors and one clear element, means for rotating said color wheel, and means for synchronizing the excitation of said cathode ray tube with the rotational position of said color wheel so that the color of each light source is accurately represented in the converted calligraphic image; means for superimposing and combining said color TV monitor image and said full-color spectrum calligraphic image; and optical means for enabling said traineee to observe the superimposed and combined images.

4,055,005

COVER FOR BICYCLING SHOE TO PROVIDE A WALKING SURFACE

Robert H. Meinhart, 354 Wilbur Road, Thousand Oaks, Calif. 91360

Filed Oct. 29, 1976, Ser. No. 736,834
Int. Cl.² A43B *5/00*
U.S. Cl. 36—135 **3 Claims**



1. For use with a bicycling shoe that has a cleat attached to its bottom surface to engage the pedal structure of a bicycle, a protective cover for adapting the bicycling shoe for walking comprising:

a sole that provides a walking surface;

a toe cup attached to the toe end of said sole for receiving the toe of the bicycling shoe; and

an upstanding U-shaped wall extending from the heel end of said sole and opening toward the toe end of said sole for receiving the heel of the bicycling shoe;

said sole being of substantially greater thickness than said cup and said wall and having a substantially greater thickness at the heel than under the ball of the foot;

the upper surface of said sole defining a generally rectangular recess that extends from the portion of said sole corresponding to the ball of said foot into the arch area to receive the cleat of the bicycling shoe;

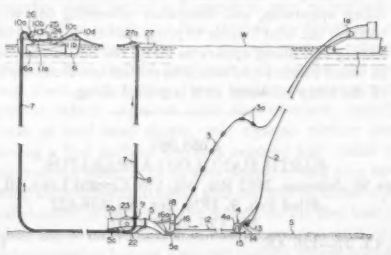
said sole, cup and wall being integrally formed from a single piece of pliable, flexible, molded, natural or synthetic rubber that can be stretched to snugly engage the bicycle shoe.

4,055,006

DEEP-SEA ORE COLLECTING AND HOISTING APPARATUS

Jitsu Shibata, Tokyo, Japan, assignor to Mitsubishi Kaihatsu Kabushiki Kaisha, Japan

Continuation of Ser. No. 506,876, Sept. 17, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,591
Claims priority, application Japan, Sept. 21, 1973, 48-106590; Oct. 3, 1973, 48-111111
Int. Cl.² E02F *3/08*
U.S. Cl. 37—69 **1 Claim**



1. In combination:

an apparatus for transporting ores from the bottom of a body of water to a level above the bottom of the body of water, said apparatus comprising a buoyant ore-collecting vessel

for collecting ore transported from the bottom of the body of water, a flexible endless rope-like member disposable in use within the body of water with a portion thereof disposed along the bottom of the body of water and with portions extending upwardly from the bottom of the body of water to the level to which the ore is to be transported and with a portion thereof extending along the length of said buoyant ore-collecting vessel and passing over said buoyant ore collecting vessel, a plurality of baggy nets along the length of said flexible endless member for receiving ore therein and carrying the ore to the level to which the ore is to be transported as said flexible endless member is longitudinally advanced, drive means mounted on said ore-collecting vessel and cooperative with said flexible endless member for advancing said flexible endless member in a longitudinal direction thereof to transport ore contained within said baggy nets from the bottom of the body of water up to said buoyant ore-collecting vessel positioned within the body of water; and means for removing ore from within baggy nets transported up to said buoyant ore-collecting vessel and depositing the removed ore within said ore-collecting vessel; and

an ore collecting and filling apparatus disposable in use on the bottom of the body of water for retrieving ore therefrom and for filling with ore said baggy nets along flexible endless member at the bottom of the body of water, said ore-collecting and filling apparatus comprising ore-retrieving means for retrieving ore from the bottom of the body of water and for filling said baggy nets with the retrieved ore, and guide means coactive with said flexible endless member for guiding said flexible endless member into position as it is advanced so that said ore-retrieving means can fill said baggy nets along said flexible endless member; wherein said apparatus for transporting ores from the bottom of a body of water further comprises: a second buoyant vessel having means for guiding said flexible endless member toward the bottom of the body of water, said second buoyant vessel being positioned in use ahead of said buoyant ore-collecting vessel with the portion of said flexible endless member extending along the length of said buoyant ore-collecting vessel further extending to said means for guiding of said second buoyant vessel and thereafter extending to said ore-collecting and filling apparatus, whereby the separation between the upwardly extending portions of said endless flexible member is substantially determined by a distance between said buoyant ore-collecting vessel and said second buoyant vessel; a winch disposable in use on the bottom of the body of water on which said ore collecting and filling apparatus is disposed, said winch having a cable connected in use to said ore-collecting and filling apparatus and being operable to let out and recover the cable; and a power and towing vessel for alternatively towing said winch along the bottom of the body of water while letting out the winch cable to position said winch on the bottom of the body of water away from said ore-collecting and filling apparatus, and thereafter powering the winch to recover the winch cable to progressively pull said ore-collecting and filling apparatus along the bottom of the body of water toward said winch to collect ore from the bottom of the body of water as it is pulled along.

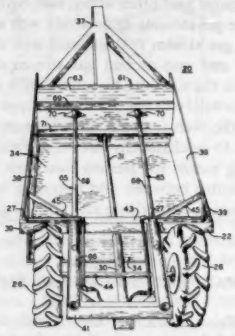
4,055,007

EARTH HANDLING APPARATUS

Bruce W. Johnson, 2602 Rte. No. 176, Crystal Lake, Ill. 60014

Filed Feb. 9, 1976, Ser. No. 656,422
Int. Cl.[2] E02F *5/00*
U.S. Cl. 37—126 AE **1 Claim**

1. An earth handling apparatus for handling loaded earth materials comprising frame means, walled enclosure means having at least a bottom wall and a pair of oppositely disposed sidewalls extending perpendicularly to engage said bottom wall, said enclosure means having at least one open-ended portion disposed forwardly thereof, and said bottom wall including cutter means adjacent to said open-ended portion, a movable end wall actuable to move forwardly and rearwardly of said bottom wall and being supportedly positioned for transverse extension between said side walls with the edge portions thereof depended in closely spaced relationship with and free of attachment and engagement with said side walls and bottom wall, means for actuating said end wall to move forwardly and rearwardly of said enclosure means, improved guide means supportingly positioning said end wall and comprising pairs of telescopically engaged inner and outer post members, said outer post members thereof fixedly supported on said frame means in parallel spaced alignment with said side walls, said inner post members thereof being supportedly received within



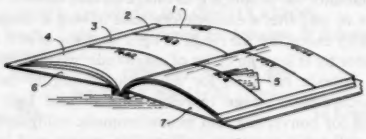
said outer post members, respectively, and slideably engaged thereby, said inner post members being supported solely by said outer post members during sliding engagement therewith, said inner post members including free end portions thereof, respectively, being attached to said end wall substantially interiorly of said edge portions thereof and being disposed on an opposite side of said end wall from loaded earth materials, both said inner and outer post member pairs being free of attachment to and spaced substantially interiorly of said side walls, and said end wall being supported solely by said inner post members with said end wall in both forward and rearward positions thereof, whereby said guide means are protected during the excavating of said earth materials.

4,055,008

ACCOUNT AND FILE BOOK

Heather Bell, Englewood, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 27, 1976, Ser. No. 662,114
Int. Cl.[2] G09F *7/00*
U.S. Cl. 40—104.19 **1 Claim**



1. An account and file book, comprising

a plurality of pages bound together to form a book, each of the pages having a plurality of non-overlapping open pockets for removably storing paper items, the pages and pockets having writing areas thereon for desired designations;

front and back covers affixed to the pages, the front cover having an open pocket on the outside surface thereof for removably storing a writing implement; and

an accordion pleated pocket affixed to the inside surface of the back cover for storing larger paper than the pockets of

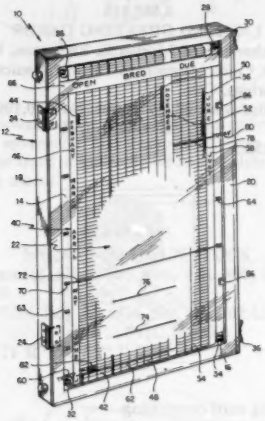
the pages in greater numbers than said pockets, said accordion pleated pocket opening in the same direction as the pages and covers of the book.

4,055,009

ANIMAL BREEDING CHART

Rudolph W. Johanns, 104 S. Court St., Wampsville, N.Y. 13163

Filed Apr. 8, 1976, Ser. No. 674,982
Int. Cl.[2] G09D *3/00*
U.S. Cl. 40—107 **5 Claims**



1. An animal breeding chart comprising:
a housing;
a roller means supported on the housing;
a calendar supported on the roller means for movement relative to the housing, the calendar having a first column extending along the housing, the calendar having a second column substantially parallel to the first column;
means dividing the first and second column into a series of days and months;
a start indicator marked on the housing adjacent the first column;
a number indicator marked on the housing adjacent the first column and spaced 60 days from the start indicator;
a main indicator line marked on the housing in alignment with the number indicator and extends across the first column and the second column; and
an animal indicator detachably placed in the first column in alignment with the start indicator and with a predetermined day and month for starting a breeding cycle for a particular animal, the animal indicator advances toward and reaches the main indicator line as the calendar moves relative to the housing at predetermined day increments for indicating breeding time for the particular animal, the animal indicator when moved from the first column and placed in alignment with the start indicator in the second column advances toward and reaches the main indicator line in the second column as the calendar advances at the predetermined day increments for indicating checking time for breeding conception of the particular animal.

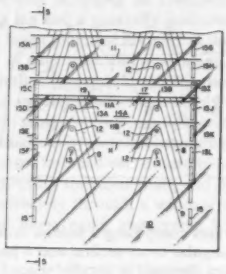
4,055,010

MICRO FILM STORING DEVICE

Gösta Fridlund, Boul.Louis Mettewie 9-11 Apt. 16B, 1080 Brussels, Belgium, and Jan Jiveman, Stravagen No. 2, Jarfanna-Jakobsberg, Sweden

Filed Mar. 12, 1974, Ser. No. 450,408
Int. Cl.[2] G09F *1/10*
U.S. Cl. 40—124 **3 Claims**

1. A storage device having pockets for receiving filamentous material, said device being formed by a base sheet and a cover sheet, said base sheet having formed therein at least one vertical row of arched cuts, said cover sheet having formed therein spaced horizontal cuts corresponding in number to each arched cut formed in said base sheet, said cover sheet being superposed over said base sheet and being secured thereto at at



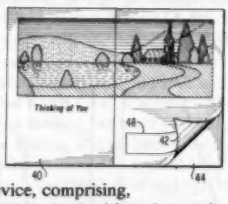
least one point adjacent each peak of each of said arched cuts and between said horizontal cuts of said cover sheet to form pockets to receive filamentous material suitable for storage, and said device further including vertical welds between said base sheet and said superposed sheet and laterally of said arched cuts to form lateral boundaries to said formed pockets.

4,055,011

CALENDARS AND DISPLAY DEVICES

Lineaus W. Longenecker, R.D. 5, Manheim, Pa. 17545

Filed Sept. 18, 1975, Ser. No. 614,817
Int. Cl.[2] G09F *19/00*
U.S. Cl. 40—124.1 **5 Claims**



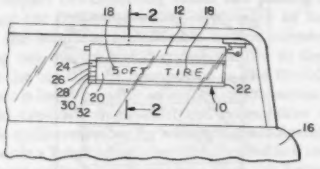
1. A display device, comprising,
a first base sheet provided with a picture thereon,
a second base sheet provided with a picture thereon,
an overlay sheet having a transparent area movable from a first position where one face thereof confronts and overlies the first base sheet to a second position where the opposite face thereof confronts and overlies the second base sheet, said overlay sheet having an opaque picture portion which registers with and obscures underlying areas of said base sheets, said opaque picture portion having a first surface which is exposed and visible when the overlay sheet is in its first position, said first surface being camouflaged to blend into and add no distinct pictorial element or outline to the picture on the first base sheet when the overlay sheet is in its first position, said opaque picture portion having a second surface which is exposed and visible when the overlay sheet is in its second position, said second surface presenting a visible pictorial element which adds to the picture on the second base sheet when the overlay sheet is in its second position over said second base sheet.

4,055,012

CARD APPARATUS

Donald F. Cote, 6 Hoover Road, Hingham, Mass. 02043

Filed Sept. 8, 1976, Ser. No. 721,183
Int. Cl.[2] G09F *7/00*
U.S. Cl. 40—129 C **8 Claims**



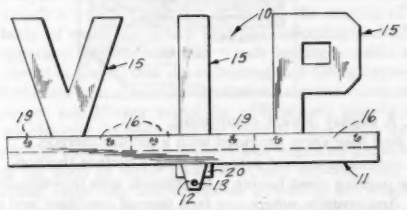
1. A card apparatus comprising a hollow housing, the housing having a rectangular cross-section and a pair of elongated rectangular surfaces disposed in parallel spaced apart relationship to each other, the pair of elongated rectangular surfaces being fabricated from a transparent material, a rectangular opening in one end of the housing being disposed intermediate the pair of elongated rectangular surfaces, means to fixedly secure one of the pair of elongated rectangular surfaces to an interior surface of a motor vehicle, a plurality of board like rectangular signs, each of the plurality of signs being disposed in parallel relationship stored within the housing, each of the signs being slidably removable from within the housing by passing through the rectangular opening, indicia carried by each of the signs, means to individually identify each of the signs by a portion thereof extending outwardly of the housing passing through the rectangular opening, wherein said portion of said each of said signs comprises a handle-like tab whose thickness excedds the thickness of the sign to which it is affixed, the lateral surfaces of the handle-like tab having corrugations disposed therein.

4,055,013

IDENTIFICATION DEVICE FOR VEHICLES

James A. Shields, 5537 Lydia, Kansas City, Mo. 64110

Filed Apr. 26, 1976, Ser. No. 680,430
Int. Cl.[2] G09F *07/08, 21/04*
U.S. Cl. 40—129 C **1 Claim**



1. An identification device for an automotive vehicle having a hood, said device including:

an elongate mounting plate having a top and bottom surface;

a groove formed in said top surface and extending longitudinally of the plate;

a hinged lug mounted on said bottom surface for swinging movement toward and away from the latter, said lug being adapted for securement on the hood of said vehice;

a plurality of letter elements adapted for mounting on said plate in side-by-side relationship;

each of said elements being provided with a normally upright character portion and elongate base portion removably received within said groove,

said base portion extending a predetermined distance beyond the side edges of its respective character portion whereby endwise abutment of said base portion against the base portion of an adjacent letter element provides preselected spacing between the respective character portion and the character portion of said adjacent element;

screw fastener means in said plate for releasably securing the base portion of each element within said groove; and

spring means yieldably biasing said lug toward said surface whereby, when said lug is mounted on said hood, said letter members may be deflected rearwardly when struck by a pedestrian.

4,055,014

LIGHTED GREETING CARDS

Terrance L. Schmidt, and Marion E. Thompson, both of Colorado Springs, Colo., assignors to The Maytronics Group, Inc., Colorado Springs, Colo.

Filed Mar. 25, 1976, Ser. No. 670,109
Int. Cl.[2] G09F *13/00*
U.S. Cl. 40—152.2 **9 Claims**

1. A greeting card comprising

a. a backing of rigid polymeric foam or the like having front and rear spaced, substantially parallel faces,

b. a sheet material card having front and rear faces, said front face having indicia formed thereon and said rear face being adapted to be received by said backing front face,

c. means defining a card receiving formation on said front face of said backing,

d. a battery,

e. means defining a first opening in said backing rear face, said first opening for receiving said battery, and said first opening dimensioned so that when said battery is received thereby no portion of the battery protrudes exteriorly of said backing, but rather said battery is generally completely contained within said first opening,

f. means defining a second opening in said backing rear face, said second opening for receipt of said battery, and said second opening dimensioned so that when said battery is received thereby said battery extends outwardly from said backing rear face and supports said backing on a horizontal surface in a generally upright position.

g. means defining at least one opening in said sheet material card for receipt of a light emitting diode therein,

h. at least one light-emitting diode disposed in said card opening for receipt thereof, said diode being visible when viewing said card front face, and

i. circuitry means for releasably connecting said light emitting diode to said battery, said circuitry means not being visible when viewing said card front face.

4,055,015

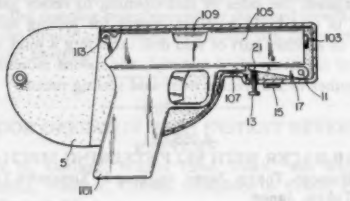
PISTOL CHARGING DEVICE

Daniel Dennis Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Filed Nov. 15, 1976, Ser. No. 741,715
Int. Cl.[2] F41C *33/04*
U.S. Cl. 42—1 R **11 Claims**

1. A charging device for a pistol charged by relative motion between a frame and a slide comprising: a holster adapted for suspension from the person of a user and having an upper end and a lower end, said holster including means to support and

guide said pistol in a slideable relationship therewith; releaseable blocking means in said holster positionally adapted for engaging said slide at a first position whereat it prevents movement of said slide toward said lower end, said blocking means



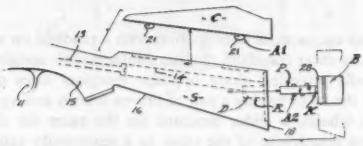
also being movable to a second position whereat it cannot prevent said movement; and means to permit a barrel to protrude from the front of said slide when said slide is engaged by said blocking means.

4,055,016

MODIFIABLE GUN STOCK

Philip K. Katsenes, 630 Idaho Ave., Apt. 105, Santa Monica, Calif. 90403

Filed July 28, 1976, Ser. No. 709,422
Int. Cl.[2] F41C *23/00*
U.S. Cl. 42—71 R **9 Claims**



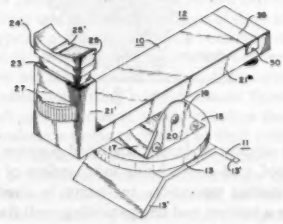
1. A modifiable gun stock comprised of a permanent stock member and replaceable comb and butt members, the comb member being releasably secured in position to the stock member by anchor means, and the butt member being releasably secured to the stock member by anchor means comprisng relatively rotatable plug and receptable means with a cam helix biasing a spring to forwardly couple the butt member into keyed engagement with the stock member to overlie and capture the comb member in its secured position.

4,055,017

MINI BENCH REST

Harold Thompson, P.O. Box 8002, Boise, Idaho 83707

Filed Sept. 2, 1975, Ser. No. 609,277
Int. Cl.[2] F41C *29/00*
U.S. Cl. 42—94 **5 Claims**



1. A bench rest, comprising:

a base including a mounting flange, an annular base ring mounted to the uppermost terminal side of said base flange to have a substantially horizontal orientation under normal mounting conditions; an annular collar journally mounted about the outer periphery of said ring, and a journal bracket issuing from the uppermost terminal side of said collar, said bracket carrying a journally mounted cylindrical shaft disposed along the horizontal plane with respect to said base; and

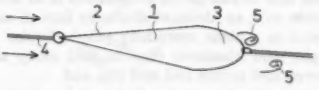
a bench assembly including an L-shaped beam having an upstanding leg and a generally horizontally disposed leg, said beam being mounted midway in the horizontal leg to said shaft of said base, the upstanding leg of said beam having a hollow polygonal cross-section, forming a cavity, a front support block subassembly including a block having the same exterior configuration as, and sliding closely in said cavity in said upstanding leg of said beam, the lowermost terminal end of said block having a dominantly projecting threaded shaft, and a thumbwheel disposed transversely through a window in said upstanding leg of said beam being engageable with said threaded shaft.

4,055,018

METHODS AND SYSTEMS RELATING TO UNDULATING MOTION

Esko Huhta-Koivisto, Saynavatie 4, 02170 Espoo 17, and Pekka Elis Piironen, Gunillankuja 5 D 22, 00840 Helsinki 84, both of Finland

Filed Nov. 10, 1975, Ser. No. 630,498
Claims priority, application Finland, Jan. 28, 1975, 750225
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.48 **8 Claims**



1. In a method for providing a regular undulating motion in a liquid for attracting aquatic creatures therein, the steps of situating a cylindrical body which has a predetermined cylinder axis in the liquid while there is a relative flow in a given direction between the body and the liquid and while positioning the body with its cylinder axis perpendicular to said direction of relative flow with the body having a configuration capable of producing Karman vortices in the fluid, the body having opposed ends which lead and trail with respect to the direction of relative liquid flow, attaching a line to the leading end of said body for trolling the latter in the liquid and attaching a hook to the trailing end of said body for catching fish attracted by the motion of said body, and supporting the body in the liquid at least in part by way of said line for free swinging movement about an axis parallel to the cylinder axis for providing for the body in the liquid an oscillating motion simulating the swimming of an aquatic creature which swims in an undulating manner.

4,055,019

CONSTRUCTIONAL TOY AND ELEMENT THEREFOR

Edward Henry Harvey, The Verne, Moor Common, Lane End, Buckinghamshire, England

Filed Jan. 19, 1973, Ser. No. 325,056
Claims priority, application United Kingdom, Feb. 3, 1972, 5126/72; Mar. 16, 1972, 12422/72
Int. Cl.[2] A63H *33/08*
U.S. Cl. 46—30 **13 Claims**

1. A substantially planar element for use in building-up a structure by hingedly and detachably connecting a plurality of such elements in edge-to-edge relationship, wherein

a. said element is of geometric shape having two margins at an angle to each other,

b. each said margin is formed with first and second projec-

tions spaced apart by a recess of substantially the same width as one of the projections,

c. the first projection is substantially at an end of the margin,

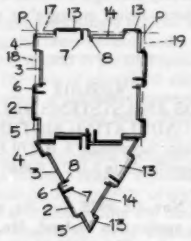
d. the second projection is spaced from the other end of that margin by a further recess, the width of which is substantially equal to the width of said first projection,

e. an end face of one projection is formed with a recessed hinge socket in the shape of a portion of a sphere,

f. an end face of the other projection is formed with a shallow protruding hinge pip also in the form of a portion of a sphere to mate with said socket,

g. the two recesses are adapted to receive and mate with the two projections of a complementary margin of another such element,

h. the arrangement is such that, in said mating, the hinge pip of each element can be sprung into the hinge socket of the other element,



i. an end face of one of the projections is an abutment face matable with an identical abutment face of another such element in a plane essentially perpendicular to the said margin, said abutment face located along said margin between said socket and said pip, and

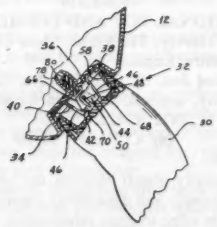
j. said projection having the abutment face including means for providing sufficient resiliency therein to maintain the hinge pip of each element in the hinge socket of the other element and to permit removal of both hinge pips from their respective sockets by resiliently moving the elements to move the abutment faces toward one another, said means for providing resilience including a slot formed in one of the projections of each margin, providing a resilient tongue which, in said mating, allows the hinge pip of each element to be sprung into the hinge socket of the other element.

4,055,020

GAS-FILLED RESILIENT DOLL WITH MOVABLE HEAD AND LIMBS

Witold W. Kosicki, Columbia, and Charles M. Hollingsworth, West Columbia, both of S.C., assignors to Horsman Dolls Inc., Columbia, S.C.

Filed Mar. 22, 1976, Ser. No. 669,290
Int. Cl.² A63H *3/06, 3/46*
U.S. Cl. 46—161 **6 Claims**



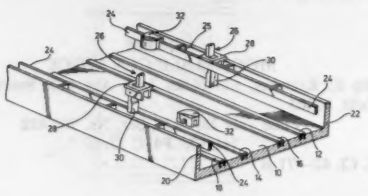
1. In a doll assembly including a sealed, gas-filled hollow body member formed by a soft and pliable gas-impervious skin, a joint member receiving recess in said skin, said recess having a wall including side and bottom portions and being formed with an opening in said wall for admitting gas under pressure into said body member, sealing means in said opening for sealing against the sides of said opening to retain gas under pressure in said body member, means for joining said body member to another part of said doll including a joint member formed of relatively rigid material, and means mounting said joint member in said recess over said sealing means.

4,055,021

TOY CAR RACER WITH SELF-STEERING MECHANISM

Shozo Okamoto, Tokyo, Japan, assignor to Yonezawa Toys Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1976, Ser. No. 676,797
Claims priority, application Japan, Apr. 18, 1975, 50-52760
Int. Cl.² A63H *18/16*
U.S. Cl. 46—202 **8 Claims**



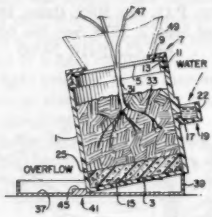
6. A toy car racer in combination with a roadbed on which said toy car racer travels in random contacts with upright side guide walls provided along opposite marginal sides of the roadbed, the racer having a pair of driven wheels and a pair of steerable wheels, a slider mounted on the racer for sliding movement lengthwise of the racer to a rearwardly extended position in which said slider may be contacted by another racer from behind, and means interconnecting said slider and said steerable wheels to swing said steerable wheels upon forward sliding movement of said slider.

4,055,022

PLANTER

Sylvester J. Rowe, 1505 N. Pulaski, Chicago, Ill. 60651

Filed July 8, 1976, Ser. No. 703,521
Int. Cl.² A01G *38/00*
U.S. Cl. 47—79 **3 Claims**



1. Means to support a planter in a tilted position during the watering thereof, said means being independent of the planter during the watering operation, including in combination, a planter having a bottom and an upstanding wall fixed thereto, and structure provided on said means to support and raise a portion of the bottom and upstanding wall of the planter during the watering operation, a portion of the bottom of said planter adjacent the edge thereof being supported in raised position on said structure, the opposite portion of the bottom of

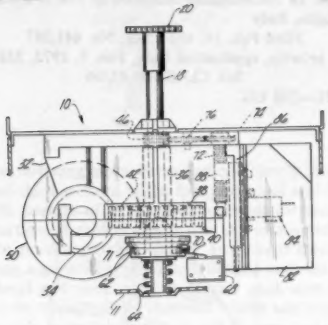
said planter resting on said means in position spaced from said structure and in a horizontal plane below said portion of the bottom of the planter which is supported on said structure, and said planter having a water intake opening in the raised portion of the upstanding wall of said planter and a water outlet opening in the opposite upstanding wall portion of said planter, said water outlet opening being oppositely disposed relative to said water inlet opening and being in a horizontal plane below the water inlet opening.

4,055,023

DOOR OPERATOR WITH INSTANT REVERSE FEATURE

Geoffrey H. Gatland, Walled Lake, Mich., and Kenneth L. Robitaille, Windsor, Canada, assignors to Vemco Products, Inc., Detroit, Mich.

Filed June 6, 1975, Ser. No. 584,620
Int. Cl.[2] E05F *15/12*
U.S. Cl. 49—28 **14 Claims**



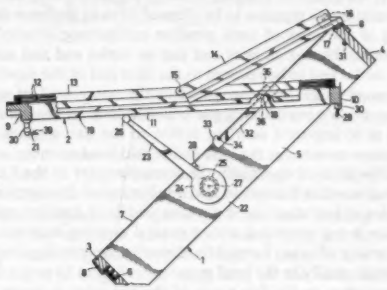
1. In a door operator: a motor for moving the door between up and down limits; an operator body; an output shaft supported by the body for rotation relative thereto: means operated by said shaft for mechanical connection to the door to move the door as the shaft rotates; a first cam element non-rotatably disposed on the shaft and spaced from the operator body; a second cam element loosely rotatably disposed on the shaft for at least limited rotation relative thereto between the first cam element and the operator body and bearing against the operator body; drive means connecting the motor to the second cam element, said first and second cam elements being urged into complemental contact with one another to form a torque coupling between the motor and the shaft capable of transmitting torques less than a predetermined value and responsive to torques in excess of said value to cause said cam elements to slip relative to one another and to cause axial shaft of the first cam element away from the second element and the body; and means carried by the body responsive to the axial shift of said first element to alter the operation of said motor, the operator further including limit means carried by the body for establishing said up and down limits of door travel, the limit means comprising a threaded shaft rotatably carried by the operator body, drive means connected between the second cam element and the threaded shaft to drive same, limit switch actuator means comprising traveler means threadedly engaging the shaft and responsive to the rotation thereof to move axially therealong a distance related to shaft rotation, first and second switch means electrically connected to the motor for controlling actuation thereof in respectively opposite directions of rotation, said first and second switch means being arranged to be actuated by said traveler at respective positions thereof representing said limits of travel, said second cam element comprising an integrally molded worm wheel of first diameter and having peripheral teeth, a hollow cylindrical portion of second diameter less than the first extending axially from said worm wheel and terminating in a second peripherally toothed gear, said second peripherally toothed gear being mechanically connected to drive the threaded shaft such that the output shaft may shift axially inside of the second cam element without disturbing the mechanical drive between the second cam and threaded shaft.

4,055,024

ROOF WINDOW ARRANGEMENT

Wilhelm Frank, Leinfelden, Germany, assignor to Wilh. Frank GmbH, Leinfelden, Germany

Filed May 3, 1976, Ser. No. 682,335
Claims priority, application Germany, May 3, 1975, 2519856
Int. Cl.[2] E05D *15/48*
U.S. Cl. 49—153 **12 Claims**



1. A window arrangement comprising:

a. a frame including a plurality of members jointly bounding an opening in said frame,
   1. one of said members extending horizontally in the normal, installed condition of said frame, and
   2. two other members extending downward from said one member in said condition and being separated by said opening;

b. a casement movable toward and away from a closing position in which said casement closes said opening;

c. elongated link means having a first end portion fastened to said frame for pivotal movement of said link means about a first axis fixed relative to said link means and to said frame, said first axis being adjacent said one member, said link means having a second end portion fastened to said casement for pivotal movement of said casement relative to said link means about a second axis spaced from said first axis and remote from said one member and parallel to said first axis, said second axis being fixed relative to said casement and to said links;

d. locking means for locking said casement to said link means for joint movement of said casement with said link means about said first axis toward and away from said closing position of said casement; and

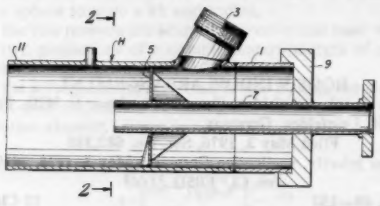
e. two slide members on said casement respectively engaging said two other members of said frame for sliding movement on the engaged slide members toward and away from said one member during said pivotal movement of said casement about said second axis while said link means pivots about said first axis, said slide members abuttingly engaging said two members in said closing position of the casement and moving away from said two members during said joint movement of the casement away from said closing position.

4,055,025

APPARATUS FOR IMPROVED CLEANING OF PIPELINE INLETS

Ray Bruce Seese, Conroe, and Bela Lee Watson, San Leon, both of Tex., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,601
Int. Cl.[2] B24C *3/04, 5/00*
U.S. Cl. 51—411 **3 Claims**



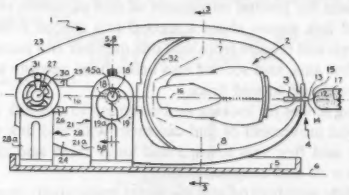
1. An injection head for introducing an abrasive ladened gas stream into a pipeline to be cleaned so as to improve the cleaning at the inlet of such pipeline comprising; a tubular head member having an inlet end and an outlet end and adapted at its outlet end to be secured to the inlet end of the pipeline to be cleaned; a gas inlet provided in the outer wall of said head member for introducing gas into said head in a radial direction so as to impact a swirling action to the gas; a quick connect closure member at the inlet end of said head member; a circular baffle plate of essentially the same diameter as the I.D. of the head member located in said head member downstream of the point of introduction of gas into said head member, said baffle plate being provided with a central opening surrounded by a plurality of vanes formed for directing gas passing through said vanes spirally to the head member walls and having a flow area equivalent to the flow area of the gas inlet; a single abrasive injection line passing through said closure member and said central opening in said baffle plate and exending beyond the baffle plate so that abrasive material is introduced into the head member downstream of said baffle plate, said injection line being secured to the baffle plate and the closure member so that the injection line and baffle plate may be removed as a unit with said closure member.

4,055,026

CLAMP FOR HOLDING ICE SKATE WHILE GRINDING BLADE

Homer A. Zwicker, Wing Road, Westford, Mass. 01886

Filed Dec. 30, 1974, Ser. No. 537,353
Int. Cl.[2] B24B *19/00*
U.S. Cl. 51—228 **8 Claims**



1. A clamp for holding an ice skate by the skate blade while grinding the edge of the blade comrising,

a base,

first and second jaws, each pivotally attached to the base,

means attached to the base for providing a pivot axle for both of said jaws, pivotally connecting the jaws together in spaced relationship to said base,

opposed gripping ends of the jaws on one side of said pivot axle for holding the ice skate blade securely therebetween, with the plane of the blade substantially parallel to the base,

a yoke attached to the base at each end of the pivot axle,

a disc eccentrically connected at each end of the pivot axle, the discs each being rotatably held by one of the yokes, rotatable on a common disc axis parallel to the axis of the axle,

means for locking said discs in position in said yokes and

means at the other side of said pivot axle for pivoting said jaws in opposite directions with respect to the base,

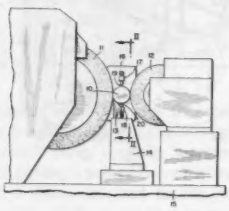
whereby the gripping ends of the jaws close and grip the ice skate blade therebetween in readiness for grinding.

4,055,027

METHOD AND RELATIVE DEVICE FOR CHECKING THE WORKING CONDITIONS DURING THE GRINDING IN CENTERLESS GRINDERS

Tomaso Freddi, Bologna, Italy, assignor to Finike Italiana Marposs Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy

Filed Feb. 11, 1974, Ser. No. 441,287
Claims priority, application Italy, Feb. 9, 1973, 3326/73
Int. Cl.[2] B24B *41/06*
U.S. Cl. 51—238 GG **7 Claims**



4. A device for checking the working conditions during the machining in centerless grinders in which the workpiece being machined is supported and driven in rotation on a surface of support means, comprising:

a measuring gauge head including a first movable arm coupled to a first position transducer and a second movable arm coupled to a second position transducer, the gauge being located in a position to keep said first arm in cooperation with the workpiece surface at a point close to said support means and to keep said second arm in cooperation with the workpiece surface at a point opposed to the preceding point;

gauge circuits connected to said first and second position transducers and including a first circuit for processing the signals of both the transducers to provide a signal responsive to the diameter of the workpiece and a second circuit connected to the first transducer to provide a signal responsive to the position of said support means surface.

4,055,028

REPLACEABLE, ONE PIECE, HINGE-TYPE, SLOT-ENGAGING PACK UNIT

James A. Belanger, Northville, Mich., assignor to Belanger, Inc., Northville, Mich.

Filed Apr. 28, 1976, Ser. No. 680,838
Int. Cl.[2] B24D *13/06*
U.S. Cl. 51—334 **26 Claims**

1. A pack unit adapted to be replaceably mounted to a support structure having a quasi-cylindrical, key-hole-type, slot-defining means disposed parallel to the longitudinal axis of the support structure, the slot having a generally cylindrical inner portion opening radially outwardly through a restricted neck portion, said pack unit comprising a substantially solid, elon-

gated, head-forming and pack reinforcing support element made from a resiliently firm yet flexible plastic material, said support element including a generally cylindrical, solid, bulb-like portion having a single, substantially flat, integral, solid fin portion of rectangular configuration extending radially outwardly therefrom, a first sheet of generally flexible material having one portion looped tightly over said elongated support element so as to conform closely to the contours thereof and a second portion extending outwardly from said support element, said looped portion having a first section closely overlying said bulb-like portion and second and third sections integrally contiguous with the respective opposite ends of said first section tightly overlying corresponding opposite sides of said

fin portion, fastening means extending completely through said second and third sections of the first portion of said first sheet and the fin portion of said support element for securing the looped portion of said first sheet to said elongated support element to prevent relative sliding movement therebetween and forming a generally cylindrical, flexible material covered, bulbous head and neck portion of said pack unit which is adapted to be telescopically received within said support slot for replaceably mounting said pack unit thereto, and a flap-like unit of finishing material having an inner portion adapted to be secured to the second portion of said first sheet and an outer portion adapted to engage a workpiece for performing a finishing operation thereon.

4,055,029

CLEANING, SCOURING AND/OR POLISHING PADS

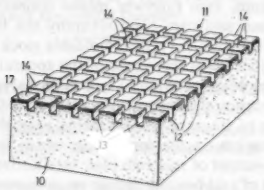
Heinz Kalbow, Lichgasse 46, D-5330 Konigswinter-Stieldorf, Germany

Filed Mar. 1, 1976, Ser. No. 662,349

Claims priority, application Germany, Mar. 7, 1975, 7507155[U]

Int. Cl.[2] B24D *15/04*

U.S. Cl. 51—395 **5 Claims**



1. In a cleaning or polishing pad comprising a pliable flexible plastic body having open cells and a scrubbing surface, the improvement comprising: a plurality of protuberances on said scrubbing surface, each of said protuberances being defined by peripheral surfaces generally perpendicular to and forming generally sharp edges with an upper scrubbing surface of said protuberance; said sharp edges have given dimensions and said protuberances have a given height, with said dimensions being substantially greater than said height; said surface includes grooves between adjacent protuberances, each of said grooves having a depth and a breadth, said depth being substantially greater than said breadth; an abrasive layer on said upper scrubbing surfaces of said protuberances, said abrasive layer includes a particulate abrasive embedded in an adhesive.

4,055,030

GREENHOUSE

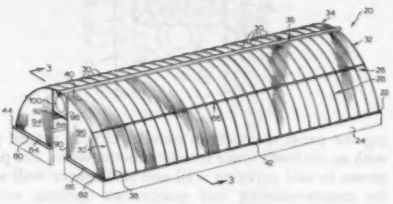
William Ferguson Earnshaw, Regina, Canada, assignor to Earnshaw Enterprises Ltd., Regina, Canada

Filed Apr. 26, 1976, Ser. No. 680,019

Claims priority, application Canada, Apr. 29, 1975, 226003

Int. Cl.[2] E04B *1/32, 1/00*

U.S. Cl. 52—86 **6 Claims**



1. A greenhouse which defines an enclosed growing area and which includes a structure covering said area, the structure comprising:

an external framework of convex shape in transverse vertical cross-section, the framework including: a plurality of curved members extending transversely of the structure in parallel longitudinally spaced positions and forming rafters of the structure, said rafters being arranged in two series extending along opposite sides of the structure and meeting at a longitudinal ridge area of the structure; a plurality of parallel elongate members extending longitudinally of the structure, the inner ends of the rafters in each of said series being coupled to one of said elongate members at said ridge area of the structure, and the outer ends of the rafters in each series being coupled to a further one of said elongate members at an outer side of the structure; and a capping element disposed at said ridge area of the structure and arranged to prevent ingress of moisture between the elongate members in said area; and,

a plurality of flexible light-transmitting panels arranged to form a covering inside the framework, said elongate members at the inner and outer ends of the rafters of each series defining opposed locating surfaces for respectively opposite ends of said panels, and each panel being fitted to the framework in a tensioned condition in which the panel bears against the inner sides of at least some of said rafters in the relevant one of said series, with its ends braced against the locating surfaces of said elongate members.

4,055,031

GASKET CONSTRUCTION

Taro Okawa, Tokyo, and Hideichi Takeda, Ichikawa, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Apr. 21, 1976, Ser. No. 678,952

Claims priority, application Japan, Apr. 22, 1975, 50-54796; June 25, 1975, 50-89925

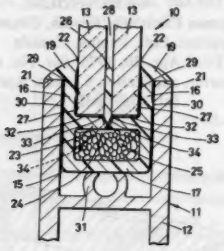
Int. Cl.[2] E04C *2/34*

U.S. Cl. 52—172 **7 Claims**

1. A gasket construction for mounting a plurality of panel members within a rigid frame, said gasket construction comprising:

A one-piece flexible body having a pair of parallel spaced opposed sidewalls, and a peripheral wall interconnecting said sidewalls to define a continuous channel of substantially U-shaped cross-section, said flexible body having a partition wall extending transversely between said sidewalls in spaced apart substantially parallel relationship to

said peripheral wall to form a continuous opening for receiving dessicant, at least one peripheral spacer wall section extending integrally from said partition wall in parallel spaced relation to said sidewalls, so that a plurality of continuous peripheral grooves are provided for receiving the panel members in parallel closely spaced planes with an enclosed space formed therebetween, and passage means in said partition wall and said spacer wall section for communicating said continuous opening with the enclosed space.

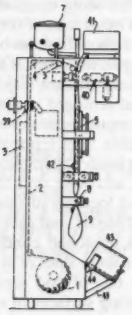


4,055,032

PROCESS FOR FORMING SEALED LIQUID FILLED BAGS

Michael George Ridler Hammond, Brunswick, Australia, assignor to A.C.I. Operations Pty. Ltd., Victoria, Australia

Continuation of Ser. No. 533,162, Dec. 16, 1974, abandoned. This application Oct. 4, 1976, Ser. No. 728,914
Claims priority, application Australia, Dec. 20, 1973, 6063/73; May 24, 1974, 7655/74
Int. Cl.[2] B65B *9/12, 55/08, 61/00*
U.S. Cl. 53—14 **5 Claims**



1. A process for continuously forming sealed liquid filled dispenser bags in a high speed automated operation from an elongate web of heat sealable plastics material comprising:

i. punching holes in said web along the length thereof at predetermined spaced intervals;

ii. orienting a plurality of dispensing closures relative to an orifice provided therein;

iii. feeding the dispensing closures in single file to a pick up position while maintaining said dispensing closures in said oriented configuration, said dispensing closures comprising attachment means having a spout with an annular flange, a diaphragm member mounted on said attachment means, said diaphragm member being manually deformable to allow flow of liquid through said spout and out of the orifice in said dispensing closure;

iv. moving dispensing closures singly from said pick up position into registry with each of said holes in said web such that a spout protrudes through each hole and the respective flange is brought into contact with the web immediately surrounding the respective hole;

v. heat sealing each flange to said web,

vi. forming said web into an upwardly directed tube by folding the web upon itself and heat sealing the overlapped portion formed thereby, whereby each flange which has been heat sealed to said web is disposed in the interior of said tube;

vii. transversely sealing a portion of said tube;

viii. separating the upper and lower portions of said tube at said heat seal during said heat sealing of said tube portion;

ix. dispensing a metered amount of liquid into said upper tube portion;

x. moving said upper tube portion containing liquid downwards; and

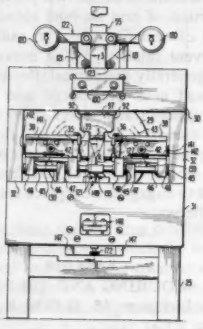
xi. repeating steps (vii) and (viii) to form a sealed liquid filled bag having a dispensing closure secured thereto which is separated from said tube and an upper tube portion which is arranged to receive a further metered amount of liquid.

4,055,033

CAM OPERATED COMPRESSION MOLDING APPARATUS

Buford C. Garrett, 412 Brook Glenn Road, Taylors, S.C. 29687

Filed Dec. 20, 1976, Ser. No. 752,095
Int. Cl.[2] B65B *11/50, 63/02*
U.S. Cl. 53—122 **32 Claims**



1. A molding apparatus comprising supporting means, a horizontal axis rotary cam plate on the supporting means, power drive means connected with said cam plate to rotate it at a predetermined speed of rotation, a pair of opposing simultaneously oppositely horizontally movable mold halves on the supporting means, cam follower means connected with the mold halves and said cam plate whereby the latter directly drives the mold halves, a vertical moldable stock magazine on the supporting means at the center of the apparatus in relation to an inward molding position of said mold halves, horizontal movement means on the supporting means including a knife to cut off pieces of stock in the magazine near the lower end thereof, mechanism on the supporting means for converting rotational movement of said cam plate into horizontal reciprocatory motion of said horizontal movement means and including a cam follower driven by said cam plate, a vertically movable carrier having guided engagement with the supporting means and including a cam follower driven by said cam plate, mold charging and stock advancing means on said carrier and being vertically movable therewith and also adapted to shift horizontally in opposite directions relative to said carrier, a horizontal movement connection between said mold charging and stock advancing means and said horizontal movement means whereby horizontal movements of the latter can cause corresponding movements of the former in the same directions of movement but at different speeds and for different distances, and said horizontal movement means including differential

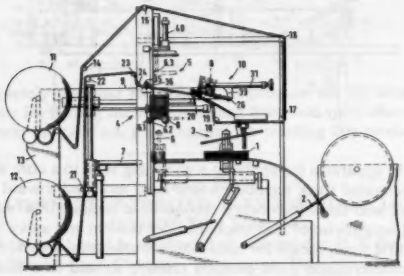
drive means for said mold charging and stock advancing means.

4,055,034

APPARATUS FOR COMPRESSING AND PACKAGING STACKS OF FLAT SUPERPOSED SHEET ARTICLES

Friedhelm Brinkmeier, Ladbergen, Germany, assignor to Windmoller & Holscher, Westphalia, Germany

Filed Feb. 7, 1977, Ser. No. 766,182
Int. Cl.[2] B65B *63/02*
U.S. Cl. 53—124 C 6 Claims



1. Apparatus for compressing and packaging stacks of flat superposed sheet articles, comprising a pressure chamber having an inlet aperture, said stacks being successively insertable in said pressure chamber through said inlet aperture, a vertically reciprocatable pressure ram for lifting each stack into said pressure chamber and pressing same against a removable backing member at the top of said chamber, means for spanning packaging film across said inlet aperture whereby said film is carried into said pressure chamber together with each lifted stack to cover the top and two sides of said stack, a transversely reciprocatable push member disposed with one end adjacent said inlet aperture of said pressure chamber for covering the underside of said stack with said film on a forward stroke, whereby to envelop said stack with said film, said ram being laterally retractable along said underside as said push member executes said forward stroke, whereby said enveloped stack is supported by said push member on termination of said forward stroke, welding means for joining the ends of said enveloping film to form a sleeve upon termination of said forward stroke, said push member comprising a frame and a plurality of parallel rollers freely rotatably mounted in said frame, and means for lowering the other end of said push member during or after its return stroke, whereby said push member additionally acts as a roller ramp for withdrawing the enveloped stack supported thereby.

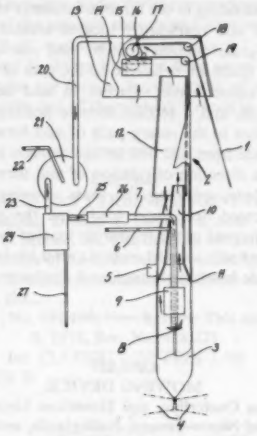
4,055,035

METHOD AND AN ARRANGEMENT FOR THE PURIFICATION OF AIR IN PACKING MACHINES

Uno Roland Sjöstrand, Flyinge, and Göran Karl Nils Johnansson, Harlosa, both of Sweden, assignors to AB Ziristor, Lund, Sweden

Filed Mar. 25, 1976, Ser. No. 670,367
Claims priority, application Sweden, Apr. 7, 1975, 7503934
Int. Cl.[2] B65B *55/12*
U.S. Cl. 53—167 2 Claims

1. A method for the purification of air mixed with a sterilizing agent in a machine for the manufacture of sterile packages in which a web of packaging material is sterilized by a sterilizing agent in vapor or liquid form comprising the steps of removing sterilized air mixed with a sterilizing agent from the packaging machine, supplying the sterilized air mixed with the sterilizing agent to a liquid sealed centrifugal compressor, mixing the sterilizing agent with the sealing liquid of the compressor while separating the sterilized air therefrom, removing the sterilized air and any entrained sealing liquid from the compressor, separating the entrained liquid from the sterilized



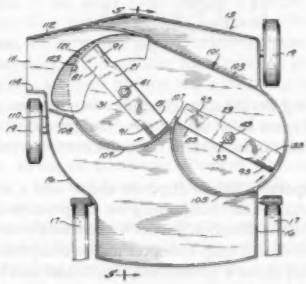
air and returning the sterilized air to the packaging machine for reuse.

4,055,036

MULTIPLE SPINDLE ROTARY MOWER

Earl H. Kidd, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 555,964, March 6, 1975, abandoned.
This application Aug. 26, 1976, Ser. No. 718,097
Int. Cl.[2] A01D *35/264*
U.S. Cl. 56—13.6 24 Claims



1. A rotary lawn mower comprising a blade housing, means supporting said blade housing for travel in a forward direction in adjacent relation to the ground, a first rotary cutter blade supported for rotation within said blade housing about a forwardly located axis, and a second rotary cutter blade supported for rotation within said blade housing about an axis located in laterally rearwardly offset relation from said rotary axis of said forwardly located first cutter blade, said blade housing further including a grass clipping discharge outlet located, at least in part, forwardly of said rotary axis of said forwardly located first cutter blade, and diametrically opposite with respect to said rotary axis of said forwardly located first cutter blade from said rotary axis of said rearwardly located second cutter blade, and in adjacent relation to the rotary path of said forwardly located first cutter blade for discharging from said blade housing grass clippings delivered solely from said forwardly located first cutter blade, said blade housing further including a depending wall including a generally

straight portion extending in adjacent relation to a tangent extending from the peripheries of the rotary paths of said cutter blades, a first arcuate portion merging with said straight portion and extending in the direction counter to the direction of rotation of said rearwardly located second cutter blade, whereby the grass clippings cut by said rearwardly located second cutter blade are delivered to the path of the forwardly located first cutter blade adjacent to said depending wall straight portion, and a second arcuate portion extending in adjacent relation to the rotary path of said forwardly located first cutter blade from said first arcuate portion in the direction counter to the direction of rotation of said forwardly located first cutter blade, whereby the grass clippings cut by said forwardly located first cutter blade and the grass clippings delivered to the path of the forwardly located first cutter blade from the rearwardly located second cutter blade are delivered from said blade housing through said discharge outlet.

4,055,037

MOWING DEVICE

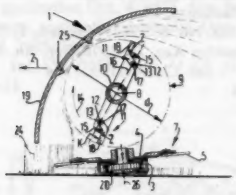
Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B. V., Nieuw-Vennep, Netherlands

Filed Dec. 29, 1975, Ser. No. 644,861

Claims priority, application Netherlands, Jan. 13, 1975, 7500383

Int. Cl.[2] A01D *84/00*

U.S. Cl. 56—16.4 **9 Claims**



1. A mowing device comprising in combination:

a frame adapted to be moved over the ground;

cutter means carried by said frame for cutting a crop swath; and

crop transporting means disposed above said cutter means for engaging and transporting cut crop rearwardly with respect to the direction in which said frame is moved over the ground, said crop transport means comprising a rotor journalled about a substantially horizontal axis transverse to said direction of frame movement;

a plurality of crop-engaging members;

pivot means pivotally connecting said crop-engaging members individually to said rotor so that said crop-engaging members are rotated by said rotor in generally vertical side-by-side planes extending in said direction of movement and are rotated about said pivot means by centrifugal force toward positions in which the centers of gravity of said crop-engaging members lie in a radial plane containing said substantially horizontal axis and the axis of said pivot means; and

stop means, carried by said rotor and disposed in the path of rotation of said crop-engaging members about said pivot means, for individually preventing the crop-engaging members from reaching said positions, whereby said centers of gravity lie behind said radial plane and the paths swept by those portions of the crop-engaging members most remote from said pivot means are in predetermined spaced relation to said cutter means.

4,055,038

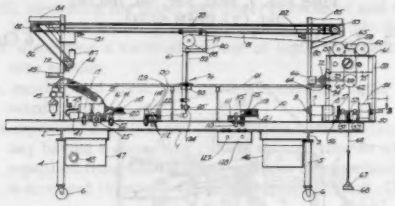
APPARATUS FOR WRAPPING STRINGS FOR MUSICAL INSTRUMENTS

Harold A. Conklin, Jr., Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed Mar. 1, 1976, Ser. No. 662,610

Int. Cl.[2] B65H *81/06*; G10D *3/10*

U.S. Cl. 57—11 **37 Claims**



1. In apparatus for applying a wrapping wire to a core wire, an elongated track member, a first head mounted toward one end of said track member, a second head mounted for movement lengthwise of said track member toward and away from said first head, means for releasably securing said second head in predetermined fixed position relative to said first head, a shaft rotatably journaled in each of said heads, said shafts facing each other and being in axial alignment, means for rotating said shafts in unison, means on said shafts for connecting the opposite ends of a core wire thereto, means associated with one of said heads for placing the core wire under tension, means for feeding a wrapping wire into contact with the core wire, adjustable means for establishing a predetermined approach angle at which the wrapping wire is fed into contact with the core wire, means for advancing said wrapping wire feeding means lengthwise of said track in timed relation to the formation of convolutions of wrapping wire around the core wire as the latter is rotated, means for applying a predetermined uniform tension to the wrapping wire as it is fed into contact with the core wire, and control means for rotating said shafts through a desired number of revolutions to form a like number of convolutions of wrapping wire on the core wire.

4,055,039

APPARATUS FOR OBTAINING SELF-TWISTED PRODUCT

Pavel Mikhailovich Movshovich, Pechatnikov pereulok, 3, kv. 8; Gennady Konstantinovich Maximov, Kaspiiskaya ulitsa, 20, korpus, 3, kv. 137, both of Moscow; Viktor Pavlovich Khavkin, Khimki, ulitsa Valutina, 11, kv. 4, Moskovskaya oblast; Lev Nikolaevich Ivanov, Kotelnicheskaya naberezhnaya 25/8, kv. 74, Moscow; Natalya Borisovna Babushkina, Chasovaya ulitsa, 5b, kv. 15, Moscow; Vladimir Konstantinovich Afanasiev, Galyanovsky proezd, 4a, kv. 219, Moscow; Tamara Nikolaevna Kudryavtseva, Davydkovskaya ulitsa, 6, kv. 5, Moscow, and Sergei Vladimirovich Nezelenov, Kineshemskoe shosse, 8a, kv. 6, Kostroma, all of U.S.S.R.

Filed July 21, 1976, Ser. No. 707,212

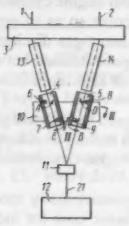
Claims priority, application U.S.S.R., July 29, 1975, 2164973

Int. Cl.[2] D02G *3/28*

U.S. Cl. 57—34 AT **7 Claims**

1. An apparatus for obtaining a self-twisted product from at least two strands, comprising: a plurality of swirl chambers, each having an inlet end and an outlet end; a mechanism for continuously feeding respective strands into said plurality of swirl chambers; at least two jet passages in each said swirl chamber, adapted to alternately produce in this chamber air swirls of opposite directions effecting the twisting of a respective strand; said jet passages in each said swirl chamber being relatively equally displaced longitudinally of this chamber; in each pair of the adjacent ones of said plurality of swirl chambers respective jet passages producing the air swirls of the

same direction being arranged one at the inlet end of its respective swirl chamber and the other one at the outlet end of its respective swirl chamber; an arrangement for supplying air



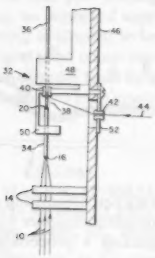
alternately into said jet passages to produce the air swirls; a device for uniting the strands issuing from said swirl chambers to form the product; a mechanism for winding this product.

4,055,040

ALTERNATELY TWISTED YARN ASSEMBLY AND METHOD FOR MAKING

Perry Han-Cheng Lin, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 13, 1976, Ser. No. 676,423
Int. Cl.[2] D02G *3/28, 3/38*
U.S. Cl. 57—140 BY **13 Claims**



1. In the method for making an alternate-twist, plied yarn including applying false-twist as alternate S and Z regions of twist repeatedly throughout the lengths of at least two, primary, separated, multifilament, textile strands, said regions of twist being separated by nodes of zero twist, converging the false-twisted strands without snubbing immediately downstream of the point at which the twist is applied, and snubbing the converged strands at a point downstream of the twisting point a distance less than the distance between nodes and greater than one-half the distance between nodes, and permitting the twisted regions of the converged strands to partially untwist and to ply-twist with one another while constraining the untwisting of the strands in the plying zone sufficiently to slow down but not prevent untwisting and plying of the strands, the improved method for incorporating a secondary strand into the plied yarn comprising converging a secondary strand with the primary strands at a point in the constrained, plying zone downstream of the convergence point of the primary strands, and permitting the secondary strand to ply with and alternately twist around the primary strands.

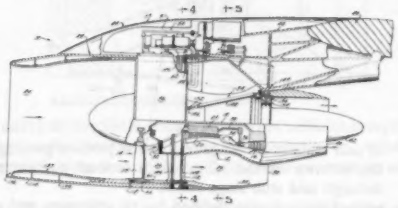
12. An improved unitary, twist-stable yarn including a plurality of alternately-twisted, multifilament strands which are plied about one another by alternating S and Z regions of twist repeatedly throughout the length of the yarn, each of the S and Z regions comprising at least two primary strand segments whose direction of twist is opposite to that of the region, and with zero twist nodes between each S and Z region, wherein the improvement comprises a secondry strand plied with and alternately-twisted around the primary strands, the node interval of the secondary strand being substantially the same as that of the primary strands, the nodes of the secondary strand being displaced with respect to the nodes of the primary strands, and the twist level between nodes for the secondary strand being less than that of the primary strands and wherein the primary strands are bulked, continuous filament, carpet yarns and the secondary strand is antistatic and at least some of the secondary strand nodes are formed by wrapping of the secondary strand around only one of the primary strands in a portion of a primary node.

4,055,041

INTEGRATED GAS TURBINE ENGINE-NACELLE

Arthur P. Adamson; Donald F. Sargisson, both of Cincinnati, and Charles L. Stotler, Jr., Fairfield, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 522,108, Nov. 8, 1974. This application Nov. 3, 1975, Ser. No. 628,221
Int. Cl.[2] F02C *7/20*; F02K *3/04*
U.S. Cl. 60—226 R **6 Claims**



1. An integrated propulsion system comprising:

a pylon;

a gas turbofan engine including a core engine for rotatably driving a fan stage to pressurize a motive fluid, a fan bypass flow annulus generally circumscribing said core engine, a core engine inlet duct communicating with said bypass duct, a flow splitter for separating the fan motive fluid into a bypass portion and a core engine portion, an integral composite frame having first and second generally concentric hoop means of bonded composite filament fabrication interconnected by generally radially extending outer struts of composite filament fabrication bonded thereto, said first hoop means substantially spanning said flow splitter and said second hoop means sandwiched between inner and outer walls of composite filament fabrication bonded thereto, said inner wall defining an outer aerodynamic contour of the turbofan engine, and wherein said inner wall, said outer wall and said second hoop means form a shroud entirely supported in spacial relationship with said first hoop means through said outer struts; and

mounting means connecting said first hoop means to said pylon.

4,055,042

BYPASS GAS TURBINE FAN EMPLOYING A STUB ROTOR STAGE AND A MAIN ROTOR STAGE

Rowan Herbert Colley, Sunnyhill, England, assignor to Rolls-Royce Limited, London, England

Filed July 8, 1976, Ser. No. 703,658
Claims priority, application United Kingdom, July 19, 1975, 30350/75
Int. Cl.[2] F02K *3/06*
U.S. Cl. 60—226 R **5 Claims**

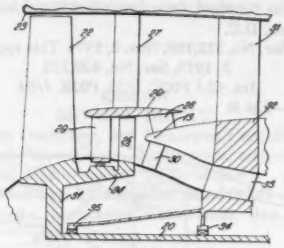
1. A gas turbine engine comprising

a core engine having an intake and having compressor

means, combustion chamber and turbine means in flow series;

a fan upstream of said intake of said core engine and operatively driven by said core engine, said fan including at least one annular array of rotor blades defining a main rotor stage and a further annular array of rotor blades downstream of said main rotor stage and defining a stub rotor stage, said further annular array of rotor blades of said stub rotor stage having a smaller radial extent than said at least one annular array of rotor blades of said main rotor stage, said main rotor stage and said stub rotor stage each being adapted to compress air to form a main fan airflow and a stub stage airflow respectively;

a first splitter ring extending around said stub rotor stage and defining an outer boundary of said stub stage airflow, said first splitter ring being arranged to divi-e said main airflow



of said main rotor stage into a first portion passing about the exterior of the same and a second portion passing through said stub stage rotor;

a second splitter ring defined by an upstream end of said intake of said core engine, said second splitter ring being arranged to divide said stub stage airflow into a first portion which enters said core engine through said intake and a second portion which joins said first portion of said main fan airflow; and

inner and outer stub stage outlet guide vanes extending respectively inwardly from said second splitter ring and outwardly of said second splitter ring to said first splitter ring, said inner and outer stub stage outlet guide vanes being adapted to give different degrees of deflection to said first and second portions of stub stage airflow respectively.

4,055,043

MANIFOLD REACTOR

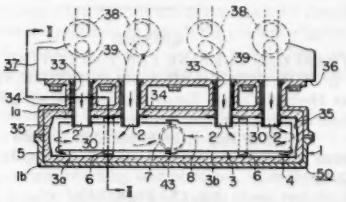
Masami Konishi, and Kazumasa Futamura, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 15, 1976, Ser. No. 677,376

Claims priority, application Japan, Nov. 11, 1975, 50-134708; Nov. 11, 1975, 50-134709

Int. Cl.² F01N *3/10*

U.S. Cl. 60—282 **8 Claims**



1. In a manifold reactor for an internal combustion engine, the reactor including an inner core and an outer core of an elongated cylindrical form, said inner core being concentrically placed within said outer core in spaced relation from the walls of said outer core both in the radial direction and in the axial direction and having open, opposite ends; exhaust gas intake pipes extending from engine cylinders through the walls of said outer and inner cores so as to open within said inner core; and at least one exhaust-gas discharge pipe, having one end open to an annular space defined between the wall of said outer core and the wall of said inner core; the improvements comprising:

at least two axially aligned cylindrical parts constituting said inner core, said parts having overlapping contiguous ends forming sliding air-tight connection between adjoining parts; and

supporting members symmetrically spaced about said cylindrical parts of said inner core for independently securing each of said cylindrical parts of said inner core to the inner surface of said outer core.

4,055,044

ROCKET ENGINE CONSTRUCTION AND CONNECTION FOR CLOSED AND OPENED FLUID COOLING CIRCUITS FOR THE WALLS THEREOF

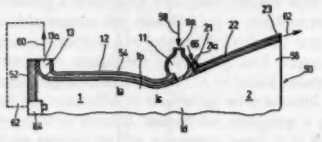
Helmut Dederra, Ottobrunn; Gunther Schmidt, Unterhaching, and Jürgen Stanke, Ottobrunn, all of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Nov. 11, 1974, Ser. No. 522,990

Claims priority, application Germany, Nov. 13, 1973, 2356572

Int. Cl.² F02K *9/02, 11/02*

U.S. Cl. 60—265 **5 Claims**



1. A fluid cooled rocket, comprising a tubular housing forming an interior combustion chamber having a closed end with an injector for injecting a propellant component into said combustion chamber and an opposite opened end forming a thrust gas discharge, said housing side walls defining an inwardly converging portion, a nozzle neck portion of smallest diameter, and an outwardly diverging portion extending from said closed end toward said gas discharge open end, said inwardly converging portion, said nozzle neck portion, and at least a part of said diverging portion having a first annular wall defining a first section with a plurality of circumferentially arranged longitudinally extending first cooling channels therein, a first inlet duct connected to said cooling channels adjacent the ends thereof which are toward the discharge open end, a first outlet duct connected to said cooling channels at the ends thereof adjacent said closed end and connected to said injector head for discharge into said combustion chamber, said first cooling channels and said first and second ducts being in a closed regenerative cooling fluid circuit, at least a portion of the remaining part of said diverging portion having second walls with a plurality of circumferentially arranged and longitudinally extending second cooling channels and defining a second section, means detachably connecting said second section to said first section, said second section being severable from said first section directly adjacent to said first inlet, said first section being constructed with said part of said diverging portion shaped to provide satisfactory operation for testing at atmospheric conditions on the ground, and said second detachable section having said at least a portion of the remaining part of said diverging portion shaped to provide the necessary divergence for vacuum operation, a second inlet connected to said second cooling channels at their ends thereof adjacent said closed end, the opposite ends of said cooling channels being

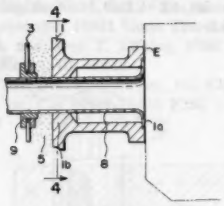
open to permit the discharge of the coolant in the general direction of the thrust gas discharge, said first and second inlets comprising a single annular connection duct having passage connections to said first cooling tubes and said second cooling tubes.

4,055,045

PORT LINER SUPPORT DEVICE

Kazumasa Futamura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Apr. 12, 1976, Ser. No. 676,205
Claims priority, application Japan, Aug. 15, 1975, 50-112920
Int. Cl.[2] F01N *3/10, 7/00*
U.S. Cl. 60—322 **5 Claims**



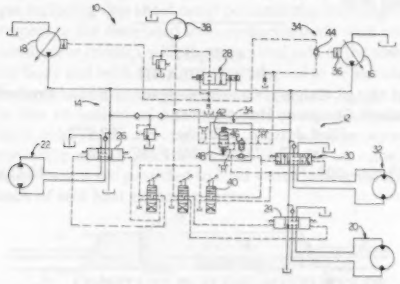
1. In a manifold reactor comprising an outer shell having an exhaust gas inlet port therein, a sealing ring surrounding said inlet port, and a liner for said port leading into said reactor through said sealing ring, an improved support casing for said liner, which support casing is adapted to be connected at one end to a cylinder head fixture and comprises a projection on its inner surface between the cylinder head fixture and said sealing ring, which projection is adapted to fit against and support said liner.

4,055,046

CONTROL SYSTEM HAVING OVERRIDE FOR FLUID OPERATED WORK ELEMENTS

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 22, 1976, Ser. No. 753,251
Int. Cl.[2] F15B *13/06, 13/09*
U.S. Cl. 60—428 **6 Claims**



1. In a fluid system having first and second circuits each having a variable displacement pump serving respective first and second work elements through respective first and second directional control valves and being associated with a summing valve for controlling said pumps, the improvement comprising:

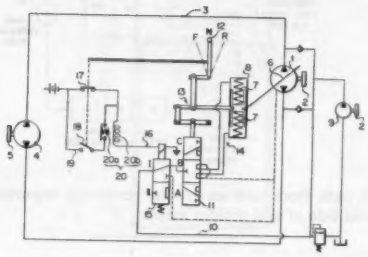
first means for controlling the output from the pump of one of the first or second circuits in response to a signal delivered from the summing valve during operation of the work elements of both circuits and for controlling the output of the said pump by a modified pilot pressure signal in response to the operation of only the work element of the selected one of the first or second circuits.

4,055,047

SAFETY DEVICE FOR HYDRAULICALLY DRIVEN VEHICLES

Hideo Hara, Kawasaki, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed July 29, 1976, Ser. No. 709,645
Claims priority, application Japan, July 29, 1975, 50-104125
Int. Cl.[2] F16H *39/46;* **F15B** *20/00*
U.S. Cl. 60—444 **6 Claims**



1. A safety device for hydraulically driven vehicles comprising a hydraulic motor for driving said vehicles, a variable displacement pump for supplying fluid under pressure to said motor,

means for controlling displacement of said variable displacement pump,

an additional pump for supplying fluid under pressure to said means, control lever means connected to said means for controlling forward and backward movements of said vehicles, valve means provided between said additional pump and said means for selectively communicating said means with said additional pump, and switching means connected to said control lever means to selectively open or close said valve means in response to the operation of said control lever means wherein said switching means is turned "ON" when said control lever means is at its neutral position and turned "OFF" when said control lever means is either at forward or backward movement position.

4,055,048

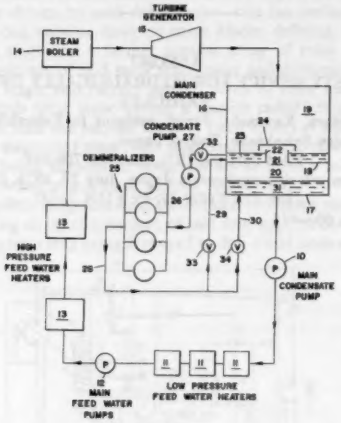
APPARATUS AND METHOD FOR SIDE STREAM DEMINERALIZATION OF CONDENSATE IN A STEAM CYCLE

Charles W. Reed, 5174 Brookside Lane, Concord, Calif. 94521

Filed Aug. 20, 1976, Ser. No. 716,319
Int. Cl.[2] F01K *19/00*
U.S. Cl. 60—646 **10 Claims**

1. In a power plant steam cycle having at least one main steam condenser with a hot well, a side stream condensate purification system for clean-up of the feed water comprising: divider means in said condenser disposed for separating condensate on a first side of said divider means from condensate on the second side of said divider means and in the hot well; a passageway through said divider means for flowing condensate from the first side thereof to the second side thereof and to said hot well; means for removing impurities from said feed water spaced from said condenser; first conduit means defining a fluid path from the first side of said divider means to said means for removing impurities; second conduit means defining

a fluid path from said means for removing impurities to the first side of said divider means; and third conduit means defining a



fluid path from said means for removing impurities to the second side of said divider means.

4,055,049

CONSTANT BOILING MIXTURES OF 1,2-DIFLUOROETHANE AND 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

Kevin P. Murphy, Orchard Park, and Richard F. Stahl, Hamburg, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 15, 1976, Ser. No. 750,758
Int. Cl.[2] C09K *5/04;* F01K *25/06*
U.S. Cl. 60—651 **4 Claims**

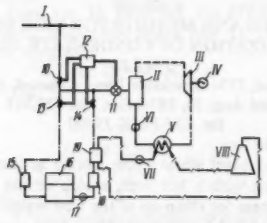
1. Constant boiling mixtures consisting essentially of about 43 weight percent of 1,2-difluoroethane and about 57 weight percent 1,1,2-trichlorotrifluoroethane.

4,055,050

APPARATUS FOR AND METHOD OF REGASIFYING LIQUEFIED NATURAL GAS

Vladimir Borisovich Kozlov, ulitsa Butlerova, 2, korpus 2, kv. 134, Moscow, U.S.S.R.

Filed Feb. 11, 1976, Ser. No. 657,297
Int. Cl.[2] F01K *13/00*
U.S. Cl. 60—692 **6 Claims**



1. A steam power plant comprising:

a boiler unit heatable by gas supplied from a pipeline for converting water into steam, at least part of the gas being storable as reserve liquefied gas;

a turbine powered by the steam generated by said boiler unit, the steam giving up energy to power said turbine;

a condenser for receiving the energy-depleted steam from said turbine, said condenser including a cooling circuit having water circulation; a storage facility for the reserve liquefied gas; and

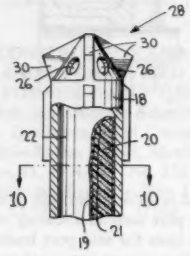
heat exchanger means for regasifying the liquefied gas, at least a portion of said cooling circuit being in heat-exchange contact with the liquefied gas, whereby the liquefied gas is regasified by way of step regasification and supplied to said boiler unit upon a deficiency of gas occurring in the pipeline.

4,055,051

UNITARY DRILL BIT AND ROOF BOLT

James Lee Finney, Cranbury, N.J., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 8, 1976, Ser. No. 647,522
Int. Cl.[2] E21D *21/00, 20/02*
U.S. Cl. 61—45 B **19 Claims**



1. A unitary roof bolt and drill bit for forming a bore hole in a mine roof and for subsequent permanent mounting therein in order to strengthen same, which comprises:

a rigid tubular body,

bit means formed at one end of said tubular body for drilling a bore hole in the mine roof,

adhesive and hardener means, which, upon mixing, secure said tubular body within said bore hole, being integrally carried with and within said tubular body, aperture means on said tubular body for releasing said adhesive and hardener means into said borehole, and

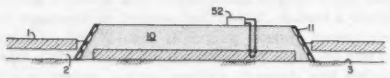
bearing plate means formed at the outer end of said tubular body, for substantially covering the opening of said hole when said tubular body is adhesively secured therein by said adhesive and hardener means, and bearing against said roof.

4,055,052

ARCTIC ISLAND

Michel Metge, Calgary, Canada, assignor to Exxon Production Research Company, Houston, Tex.

Filed July 30, 1976, Ser. No. 709,973
Int. Cl.[2] E02B *3/00;* F25C *1/02*
U.S. Cl. 61—103 **12 Claims**



1. A method for constructing an island in a body of water having an ice sheet floating thereon which comprises:

placing sufficient fill material having a density greater than the water on a first piece of the ice sheet which is to become an integral part of the island to round the first piece;

separating the first piece from the surrounding ice sheet;

placing an amount of fill material having a density greater than the water on a second piece of the ice sheet which is to become an integral part of the island, said amount of fill

material being not more than the amount which allows the second piece of ice to remain floating at the water's surface;

separating the second piece from the surrounding ice sheet;

positioning the second piece over the grounded first piece;

placing additional fill material having a density greater than the water on the second piece to sink it atop the first piece; and

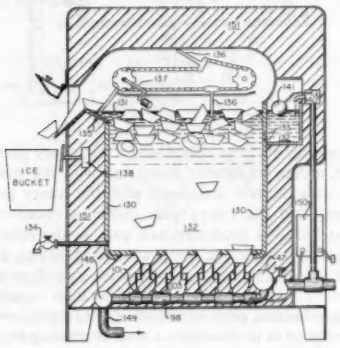
placing sufficient matter upon the grounded pieces to construct an island.

4,055,053

THERMOELECTRIC WATER COOLER OR ICE FREEZER

Thore M. Elfving, deceased, late of San Mateo, Calif.; by Claes T. Eleving, executor, 10951 Santa Theresa Drive, Cupertino, Calif. 95014, and Sven T. Elfving, 1560 Sandburg Terrace Apat.501, Chicago, Ill. 60610

Filed Dec. 8, 1975, Ser. No. 638,830
Int. Cl.[2] F25B *21/02;* F25C *5/18*
U.S. Cl. 62—3 **16 Claims**



1. A thermoelectric water cooling or freezing assembly comprising semiconductor bodies of P-type and N-type semiconductor material each having hot and cold sides of predetermined area with similar sides adapted to be connected in series by junction bridges to form thermocouples, said junction bridges including thin sheet metal portions disposed edgewise with respect to the associated semiconductor body with one edge in conductive contact with the associated side of the semiconductor body and with the other edge adapted to be associated with heat exchange means to the surrounding media, characterized in that an individual heat exchange means is associated with each cold junction bridge, said heat exchange means facing upwardly and adapted to freeze at least one ice cube and container means are provided to hold water in heat exchange with each of said heat exchange means.

4,055,054

CONSTANT BOILING MIXTURES OF DICHLOROMONOFLUOROMETHANE AND 1-CHLORO-2,2,2-TRIFLUOROETHANE

Kevin P. Murphy, Orchard Park; Richard F. Stahl, Hamburg, and Sabatino R. Orfeo, Orchard Park, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Dec. 21, 1976, Ser. No. 753,055
Int. Cl.[2] C09K *5/04;* F25B *9/00*
U.S. Cl. 62—114 **4 Claims**

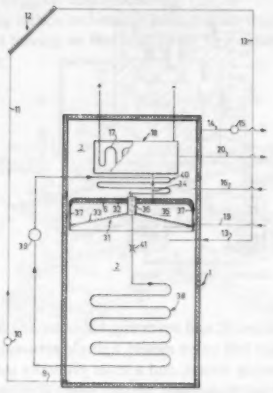
1. Constant boiling mixtures consisting essentially of about 26.2 weight % dichloromonofluoromethane and about 73.8 weight % of 1-chloro-2,2,2-trifluoroethane.

4,055,055

THERMOSIPHONIC BOILER

Ludvig L. Horwitz, Apelvagen 25, S-182 75 Stocksund, Sweden

Filed Mar. 12, 1976, Ser. No. 666,334
Claims priority, application Sweden, Apr. 1, 1975, 7503667
Int. Cl.[2] F25B *27/02*
U.S. Cl. 62—238 **6 Claims**



1. A thermosiphonic boiler with two mutually communicating water containers **(2,3)**, one **(3)** situated above the other **(2)**, said containers housing water volumes which are thermically insulated from the surroundings of the boiler by means of heat insulation **(4)** in the walls of the boiler and respectively from each other by means of a heat insulating layer **(6)** in an intermediate wall structure **(5;21;31)**, common to both containers, which separates their water volumes, characterized in that the lower container **(2)** is incorporated in an energy supply circuit **(9,11,12,13)**, through which water from the lower portion of the container can be caused to flow through heat exchanger means **(12)** arranged for heating up the water utilizing energy from a freely available source of energy and then back again to the upper portion of the container **(2)**, and that the upper container **(3)** is connected to a circulation circuit through which water from the upper portion of this container is returned to its lower portion, when needed with the aid of pump means **(15)**, via one or more heat dissipating means, there being arranged in the water volume of the upper container **(3)** a hot water supplier **(18)** supplied with water from a fresh water system **(19)** and provided with special heating means **(17)** from which supplier hot water can be tapped off, and that in the intermediate wall structure **(5;21;31)** there are first through-flow means **(7;22;36)** through which water from the upper portion of the lower container **(2)** can by thermosiphonic action or convection flow up into the upper container **(3)** and second through-flow means **(8;23;37)** through which water from the lower portion of the upper container **(3)** can flow down into the lower container **(2)**.

4,055,056

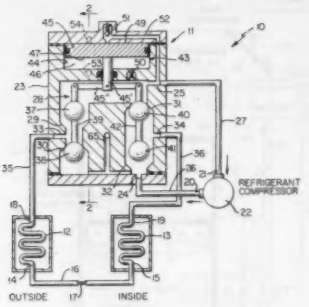
REVERSIBLE REFRIGERANT SYSTEM AND FOUR-WAY REVERSING VALVE THEREFOR OR THE LIKE

Charles H. Perkins, Newtown Square, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 526,099, Nov. 22, 1974, Pat. No. 3,972,347. This application May 17, 1976, Ser. No. 686,910
Int. Cl.[2] F25B *13/00*
U.S. Cl. 62—324 **8 Claims**

1. In a refrigerant system having a compressor and a pair of coils operatively interconnected to a reversing valve for selectively interconnecting one of the discharge side and the suction side of said compressor to one of said coils while interconnect-

ing the other of the discharge side and the suction side of said compressor to the other of said coils so that one of said coils will act as a condensor and the other coil will act as an evaporator, the improvement wherein said reversing valve has four separate movable ball valve means for effecting the reversing



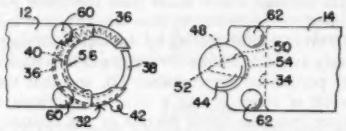
operation thereof, said reversing valve having a housing means carrying said ball valve means, a single actuating means carried by said housing means, and a lever pivotally interconnected to said actuating means and to said ball valve means to control said reversing operation thereof.

4,055,057

COUPLING DEVICE FOR THE OPPOSED ENDS OF BRACELETS

Anita M. Kolman, 527 Ramona St., Wilmette, Ill. 60091

Filed July 6, 1976, Ser. No. 702,537
Int. Cl.² A44C *5/00*
U.S. Cl. 63—7 **9 Claims**



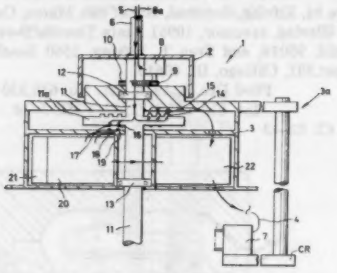
1. The combination with a bracelet consisting of first and second generally semi-circular relatively rigid sections hingedly connected in end-to-end fashion for swinging movement toward and away from each other between an open position wherein the free end regions thereof are separated, and a closed position wherein such ends are disposed in end-to-end coupled contiguity, coupling means for releasably maintaining said free end regions in their coupled relationship, said coupling means comprising a spring ring including an arcuate outer tubular sheath fixedly carried by the free end region of said first section and having opposed spaced apart ends establishing an entry gap, an arcuate plunger slidable in said sheath and movable between a retracted position wherein said gap is exposed and a projected position wherein the plunger substantially closes the gap, and a spring disposed within said sheath and yieldingly urging the plunger to its projected position, a transverse bore extending through the free end region of the second section inwardly of the extreme free end of such section and establishing an eyelet for reception of the plunger, the material of said second section forwardly of said bore being of a bulbous nature, being integral with such section, and substantially filling the internal confines of of said spring ring when said plunger is projected through said transverse bore so that the sections are coupled, said bulbous portion being formed with a narrow groove on each lateral side thereof to facilitate entry of the bulbous portion of the second section into the confines of said spring ring when the plunger is at least partially retracted.

4,055,058

ELECTRONIC CONTROL DATA TRANSMISSION FOR KNITTING MACHINES

Eric William Tewsley, Kirby Muxloe, and Ian Matthewman, Fleckney, both of England, assignors to Wildt Mellor Bromley Limited, England

Filed Sept. 12, 1975, Ser. No. 612,849
Claims priority, application United Kingdom, Sept. 17, 1974, 40577/74
Int. Cl.² D04B *15/78*
U.S. Cl. 66—50 R **9 Claims**



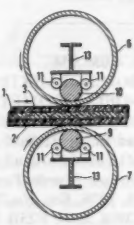
1. In a knitting machine comprising a stationary part and a rotary part, a data transmitter associated with the stationary part and a data receiver associated with the rotary part: the improvement that the rotary part carries a photo-receiver arranged to follow a predetermined path as the rotary part rotates, said photo-receiver being connected to the data receiver, and that the stationary part carries a configuration of photo-emitters, said photo-emitter configuration consisting of an array of individual photo-emitters adapted to be energized simultaneously so as to illuminate a zone containing the whole of the path of the photo-receiver, the photo-emitter configuration being connected to the data transmitter to illuminate the path of the photo-receiver with a train of light pulses corresponding to the data transmitted so that the photo-receiver produces a train of electrical pulses corresponding to the data transmitted.

4,055,059

METHODS AND APPARATUS FOR DEWATERING LEATHER

Jiri Dokoupil, Hochstrasse 13, D-6251 Guckingen, Germany

Filed Aug. 20, 1976, Ser. No. 716,179
Claims priority, application Germany, Aug. 30, 1975, 2538703
Int. Cl.² C14B *1/08*
U.S. Cl. 69—41 **10 Claims**



2. An apparatus for dewatering leather, comprising at least one pair of dewatering-pressure rolls defining a dewatering

zone, a pair of transport bands conveying the leather therebetween in a predetermined direction of travel and between the dewatering-pressure roll pair, at least one of the transport bands is structured for taking-up water, a hollow roll within which there is arranged at least one of the dewatering-pressure rolls, said hollow roll having a flexible shell, said hollow roll cooperating with the other of said dewatering-pressure rolls to define therebetween a roll nip through which passes the leather to be dewatered, the dewatering pressure being transmitted via the flexible shell of the hollow roll to the leather, said flexible shell of the hollow roll possessing a greater elasticity in radial direction in comparison to the elasticity in radial direction of said one dewatering-pressure roll arranged therein.

4,055,060

BICYCLE LOCK

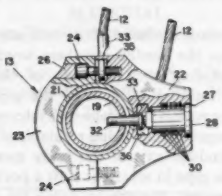
Jim Belino, 19209 Baseline, Glendora, Calif. 91776

Filed July 9, 1973, Ser. No. 377,498

Disclosure was also published under the second Trial Voluntary Protect Program on May 26, 1976 as document No. B377,498.

Int. Cl. B62h *5/06*

U.S. Cl. 70—234 **5 Claims**



1. A lock for preventing relative rotation between an external tube and a sleeve journaled to rotate therein, said lock comprising:

a member disposed around said tube and having a radially disposed bore;

said tube and said sleeve each having radially disposed holes which become aligned in a given relative position between said tube and said sleeve;

said hole on said tube being aligned with the said bore on said member;

a lock tumbler having means at one end to receive a key; and a dowel extending from the other end;

said lock tumbler being the type that has a plurality of keepers spring biased radially outward;

said bore being shaped to receive said tumbler and including detents to respectively receive said keepers;

a cable;

means for fixedly anchoring one end of said cable to said member;

said member having a cutout into one side thereof, communicating with said bore; and

said cable having an eye socket at said other end and adapted to be engaged by said dowel when said eye socket is within said cutout.

4,055,061

APPARATUS FOR REFORMING AND STRAIGHTENING VEHICLES

Jeffrey T. Bayorgeon, Milwaukee; Dirk J. Vandalen, Milton, both of Wis., and Pierre N. Legrand, Soumagne, Belgium, assignors to Applied Power, Inc., Milwaukee, Wis.

Filed Apr. 26, 1976, Ser. No. 680,146

Int. Cl.² **B21D** *1/14;* **G01B** *5/24*

U.S. Cl. 72—32 **24 Claims**

1. An apparatus for straightening and reforming the body and frame of a vehicle comprising:

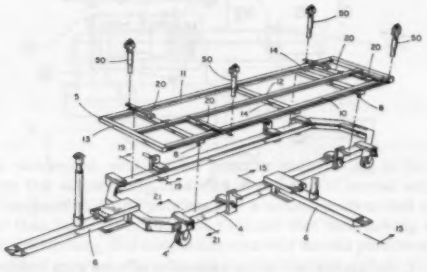
frame means adapted to be positioned beneath a vehicle;

force applying means selectively attachable to said frame means for applying a force to a vehicle through an elongated force transmitting element;

meansuring means operatively coupled to said frame means;

said measuring means being attached to a vehicle to respond to the application of force to the vehicle for a continuous indication of the magnitude of deformation of the vehicle back to its original configuration;

said measuring means includes at least one vertically extending element having an end attachable to a datum point on the vehicle;



said A means further includes first support means to support said at least one vertically extending element for movement in a first direction and second support means to support said at least one vertically extending element for movement in a second direction perpendicular to said first direction, and

said at least one vertically extending element is mounted for independent movement in said first and second directions laterally and longitudinally of the frame means in a substantially horizontal plane in response to the application of force to the vehicle.

4,055,062

PROCESS FOR MANUFACTURING STRIP LEAD FRAMES

Jack P. Martin, Lower Burrell, and Thomas H. Gray, Pittsburgh, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 596,039, July 25, 1975, Pat. No. 3,999,955. This application Oct. 7, 1976, Ser. No. 730,401

Int. Cl.² **B21B** *45/00*

U.S. Cl. 72—47 **4 Claims**

1. A process for producing strip material useful for lead frames comprising:

a. providing a strip of ferritic stainless steel not thicker than 50 mils,

b. coating all sides of said strip with a layer of copper sufficiently thick to result in a copper layer at least 50 microinches thick following cold rolling,

c. coating all sides of said copper coating with a layer of metal selected from nickel and tin sufficiently thick to result in a layer at least 50 microinches thick following cold rolling, and

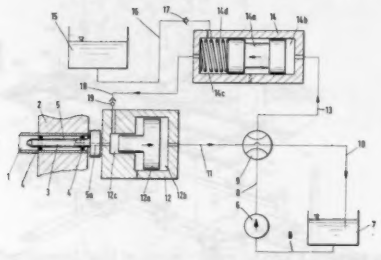
d. cold rolling the resultant composite strip to reduce its thickness to below 0.03 inches; said composite strip having a distinct layer of copper and a distinct layer of metal selected from nickel and tin thereover.

4,055,063

APPARATUS FOR THE EXPANSION OF TUBE ENDS INSIDE OF A TUBE PLATE

Herbert Krips, Bochum-Langendreer, and Miroslav Podhorsky, Bochum, both of Germany, assignors to Balcke-Durr Aktiengesellschaft, Ratingen, Germany

Filed Mar. 14, 1977, Ser. No. 777,099
Claims priority, application Germany, Apr. 14, 1976, 2616523
Int. Cl.[2] B21D *22/10*; F15B *7/00*
U.S. Cl. 72—62 4 Claims



1. An apparatus for the expansion of tube ends inside of a tube plate by means of a probe insertable in the respective tube ends, the probe forming an annular space with the tube member to be widened by means of two seals spaced from one another, a pump operatively feeding the annular space with a pressure medium for the expansion, and a pressure intensifier for bringing the pressure medium to a required pressure, comprising

a pressure intensifier defining a primary space driven by hydraulic oil and defining a secondary space,

a medium separator connected to the secondary space of said pressure intensifier,

a back-pressure valve operatively disposed between said medium separator and said secondary space of said pressure intensifier,

a piston displaceably disposed in said medium separator,

means for providing a restoring force for biasing said piston in said medium separator,

a pump means for feeding hydraulic oil displacing said piston against said restoring force of said biasing means for filling said secondary space of said pressure intensifier with an operating medium,

a source of operating medium and another back-pressure valve operatively connected to a secondary side of said medium separator, through which the operating medium is operatively fed to said secondary side of said medium separator.

4,055,064

MUFFLER AND TAIL PIPE EXPANDER AND CLEANER

Virgle L. Schow, Box 7, Fairview, Mont. 59221

Filed Jan. 8, 1976, Ser. No. 647,637
Int. Cl.[2] B21D *41/02*
U.S. Cl. 72—118 7 Claims

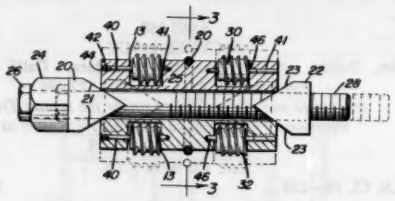
1. Apparatus for expanding and cleaning pipes of varying internal diameter, comprising:

cylindrical body means formed of semi-cylindrical segments, the segments each having mounting recesses formed in the outer cylindrical walls thereof and further having expansion recesses formed in each end thereof, and extending longitudinally through the body means to respective communication with each other, resilient means for holding the two segments together;

a cylindrical roller mounted for rotation within each of the mounting recesses, each roller having threads formed on outer cylindrical surfaces thereof, the threads being turned at an angle to the longitudinal axis of the roller;

a wedge member located at each end of the body means and being at least partially received within the expansion recesses, each wedge member having an aperture formed therethrough, one of said apertures being threaded; and,

an adjusting bolt received through the expansion recesses throughout the body means, the bolt being received through the apertures in each wedge member, at least one end of the bolt being threaded and being received within the threaded aperture in one of the wedge members, the bolt having a flanged head at the other end thereof, and a biasing member having an aperture formed therein, the bolt being received within the aperture, the biasing member lying between and being contiguous to the head of the bolt and the outer end of the other of the wedge members, the bolt being rotatable after insertion of the end of the



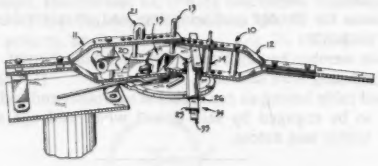
assembly opposite the head of the bolt into an open end of a pipe to bias the wedge members toward each other, thereby displacing the segments of the body means towards the internal surfaces of the pipe to cause the threads on the rollers to engage said internal pipe surfaces, the biasing member then being rotatable in a plane parallel to the longitudinal axis of the body means and of that portion of the pipe in which at least a portion of the body means is disposed, thereby to cause the body means to rotate, the rollers also rotating and causing the angled threads thereon to cut into the internal pipe surfaces and to cause the body means to be displaced inwardly of the pipe.

4,055,065

METHOD AND APPARATUS FOR SIMULTANEOUS EDGE BENDING OF STAIR RAIL CAP STOCK AND CHANNEL STOCK

Cecil Whetstone, Jr., and Anthony G. Burns, both of Winona, Minn., assignors to Hossfeld Manufacturing Co., Winona, Minn.

Filed Nov. 22, 1976, Ser. No. 743,645
Int. Cl.[2] B21D *7/03*
U.S. Cl. 72—217 6 Claims



1. An edge bending die system for simultaneously bending a length of channel stock and a length of handrail cap stock in an iron bender which includes a main frame hingedly connected by a center pin to a swing frame with a flat surface roller block releasably mounted therein, comprising:

a. a forming die mounted on the center pin, which includes a generally semi-circular portion, a horn portion extending generally tangentially from said semi-circular portion, and a first side portion extending along the periphery of said semi-circular and horn portions, said first side portion having a first groove therein extending the length of said

first side portion, said first groove being of uniform cross section over its length formed to accept the edge of a portion of a length of channel stock with a length of cap stock fitted atop thereof;

b. a back black having a second side portion with a second groove of uniform cross section over its length therein, complementing said first groove, fixedly mounted in the main frame adjacent said horn portion of said forming die, said second side portion facing toward said first side portion, the opposed grooves defining a recess that substantially conforms to the cross section of a length of channel stock with a length of cap stock fitted atop thereof; and

c. a drawing block supported in position in the swing frame by the flat surface roller block, said drawing block including a third side portion complementing said first side portion, with a third groove of uniform cross section over its length therein, facing said first side portion, the opposed grooves together defining a recess that substantially conforms to the cross section of a length of channel stock with a length of cap stock fitted atop thereof, the drawing block further including an opposite side wall abutting the surface of the flat surface roller block.

4,055,066

AUTOMATIC MACHINE FOR BENDING SHEET MATERIAL

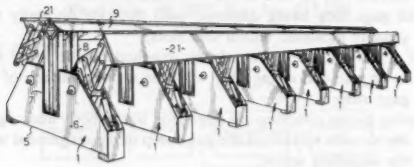
André Lamendour, Rue Gustave Zede, Z.I. de Kergonan, 29200 Brest, France

Filed Apr. 7, 1976, Ser. No. 674,314

Claims priority, application France, Apr. 16, 1975, 75.11837

Int. Cl.² B21D *5/00*

U.S. Cl. 72—306 **14 Claims**



1. An apparatus for forming bends in deformable sheet material and comprising at least one bending unit, whose outstanding characteristic is that it is made up of a fixed frame, female means for upholding and clamping sheet material in a somewhat vertical alignment, the upper edge of said female means being parallel to the longitudinal axis of the apparatus, mobile tables for bending sheet material and set out lengthwise on either side of the sheet material to bend it in one direction or in the other, said tables rotating on an axis that is parallel to the longitudinal axis of the apparatus on respective intermediary supports, each of which are independently movable on the fixed frame from a first position corresponding to a retracted position of the table to a second position corresponding to a working position of the table, and respective means for independently operating said intermediate supports and said tables for bending sheet material.

4,055,067

METHOD AND A PUNCH/DIE ASSEMBLY FOR THE PRODUCTION OF HEAT EXCHANGER FINS

Toyoo Kozima, Tokyo, Japan, assignor to Hidaka Engineering Co., Ltd., Tokyo, Japan

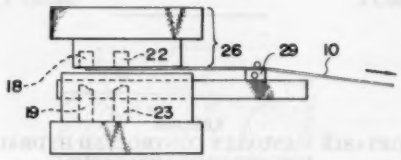
Filed Aug. 13, 1975, Ser. No. 604,306

Claims priority, application Japan, Sept. 11, 1974, 49-103808

Int. Cl.² B21D *31/02*

U.S. Cl. 72—328 **4 Claims**

1. A punch and die assembly for use in the formation of flanged apertures in heat-exchanger fins, said assembly comprising a lower tool holder supporting on the upper surface thereof a plurality of sets of first and second punches with said punches in said sets being at a predetermined distance from each other, and an upper tool holder mounting on the lower surface thereof a plurality of sets of first and second diés in conformity with said first and second punches, one of said tool holders being movable towards and away from said other tool holder, said first dies each having a relatively small diameter and said first punches each having first and second surface means that, respectively, punch and bend a plurality of small diameter, flanged apertures at predetermined positions on a



single workpiece, said second punches each having a first portion that substantially conforms in size to said second surface means of said first punches and a second portion that is larger than said first portion, said second dies each having a single size opening that cooperates with said second portion of said second punches whereby said second dies and said second punches are adapted to enlarge the diameter of said small apertures into perpendicularly projecting cylinders of a predetermined length dimension by simultaneous burring and ironing operations.

4,055,068

PROCESS FOR MANUFACTURING MONOBLOC VEHICLE WHEELS

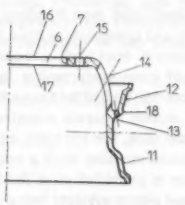
Roger Lucas, Issoire, and Jacques Auberger, Jumeaux, both of France, assignors to FORGEAL, Societe pour le Forgeage et l'Estampage des Alliages Legers, Paris, France

Filed Apr. 8, 1976, Ser. No. 674,869

Claims priority, application France, Apr. 9, 1975, 75.11725; Dec. 3, 1975, 75.37696

Int. Cl.² B21D *22/00;* **B21H** *1/02*

U.S. Cl. 72—356 **4 Claims**



1. The process of manufacturing monobloc metal vehicle wheels including a central disc portion comprising a large and small flange area, a rim portion for pneumatic tires, and a junction zone between said disc and rim portions, said process comprising a shaping step beginning with a roughly shaped article in the form of a cylindrical disc and a finishing step involving mechanical machining wherein the shaping is effected by a combination of die stamping and press widening operations consisting of the following steps: a first die stamping step producing the wheel disc and simultaneously forming on its circumference a junction zone terminating in a thickened bead oriented in a direction substantially parallel to the axis of the wheel and the inner side of the wheel to define one part of the rim portion; a second die stamping step elongating said bead and said junction zone in the same general direction as in the preceding step and simultaneously forming the rough shape of a small flange portion of the rim on the bead adjacent the junction zone; a third die stamping step forming the small flange to a shape approximating its final form and simulta-

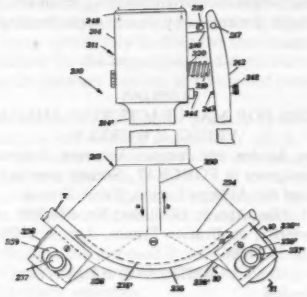
neously elongating the junction zone and the bead in the same direction as in steps one and two imparting thereto a length substantially equal to the final length of said junction zone and said bead to define the large flange portion of the rim; and a press widening of the elongated bead to a shape from which said large flange may be machined to finished form.

4,055,069

PORTABLE MANUALLY CONTROLLED HYDRAULIC PIPE BENDING APPARATUS

Alessandro Caporusso, and Mario Caporusso, both of Viale dei Mille, 12, Frosinone, Italy

Filed Mar. 31, 1976, Ser. No. 672,438
Claims priority, application Italy, Apr. 3, 1975, 12203/75; Sept. 8, 1975, 51236/75; Feb. 18, 1976, 48162/76
Int. Cl.[2] B21D *7/06*
U.S. Cl. 72—389 **9 Claims**



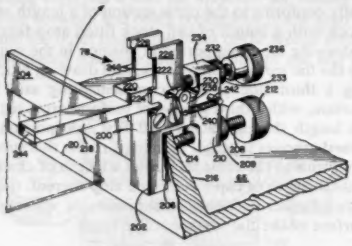
1. A portable hydraulic pipe bending apparatus which is operated manually and comprises: a main body with valve and piston systems therein enclosed; a control lever pivotable about a pin of said main body; and a fork section which is integral with the bottom end of said main body; said main body having: an upper section wherein a central cavity is provided to be used as a fluid tank, the top open end of which is closed by means of a closure member with a vent-hole, while a sealing, movable cover is provided over the fluid which fills said tank, said valve and piston systems being arranged within said upper section; and an elongated lower section the end of which is integral with said fork section of the apparatus, to the legs of which corresponding pins are fastened for guiding pipe supporting elements in rotation about said pins when a pipe bending operation is carried out; said valve and piston systems comprising: a pair of opposite ball valves for inlet or outlet fluid flow; a first cylinder-piston unit, with the piston normally held in its outwards position by a spring to intake the fluid from said tank, and which may be operated manually by means of said lever for a positive stroke which must be limited by the operator up to a predetermined angle of said lever; a second piston, to the free end of which an arched member is provided having a peripheral concave groove facing said concave grooves of said pipe supporting elements, so that a pipe to be bent may be held and bent therebetween; a third piston which is driven only when the manually controlled rotation of said lever is extended beyond said predetermined angle, to open a passageway to reverse the fluid flow and return said second piston to initial position at the end of a pipe bending operation.

4,055,070

GAGE STOP ASSEMBLY

Sidney A. Wingate, Concord, Mass., and Edward L. Dreano, Jr., Derry, N.H., assignors to Dynamics Research Corporation, Wilmington, Mass.

Filed Aug. 30, 1976, Ser. No. 718,815
Int. Cl.[2] B21D *11/22*
U.S. Cl. 72—461 **14 Claims**



1. A gage stop assembly comprising:
a body having a clamping portion by which the assembly is adjustably affixed to a mounting member;
first and second guide plates upwardly extending from the body, each having a slot therein extending along an axis of adjustment and being open rearwardly of said guide plates;
an elongated gage stop having a gaging face at the forward end thereof and an arcuate face at the rearward end thereof and an axle at the rearward portion;
said gage stop being disposed with the axle pivotally and slidably mounted within said slots;
an adjusting screw threadably attached to the body and having an end engageable with the arcuate surface of the gage stop;
spring means coupling the gage stop to the body and urging the arcuate surface of the gage stop into engagement with the adjusting screw;
said adjusting screw being manually rotatable to cause movement of the gage stop along the adjustment axis to thereby adjust the position of the gaging face;
the gage stop being pivotally movable upward from its normal position in response to an upward force applied thereto and being returnable by the spring means to its normal position.

4,055,071

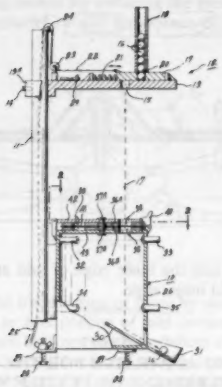
METHOD AND APPARATUS FOR DETERMINING THE WET STRENGTH OF PAPER

William C. Frazier, Vancouver, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed May 11, 1976, Ser. No. 685,160
Int. Cl.[2] G01N *3/30, 33/34*
U.S. Cl. 73—12 **12 Claims**

1. An apparatus for determining the wet strength of paper comprising means for releasing a ball from a predetermmined height to drop freely in a vertical path, clamp means to support a sheet of wet paper and to position the sheet at a predetermined location within the vertical path of the ball and perpendicular thereto, wherein the clamp means includes two discs clamped together to hold a sheet of wet paper therebetween, the two discs having a central axis of rotation, each of the two discs having a plurality of similar sized apertures equi-spaced from and about the axis of rotation, such that the apertures of one disc line up with the apertures in the other disc, wherein the wet paper is positionable between the discs so as to obstruct the apertures, the two discs being rotatably mounted about the

axis of rotation such that each of the apertures is positively locatable in the vertical path of the ball, and means for determining speed of the ball dropping in the vertical path below the clamp means.

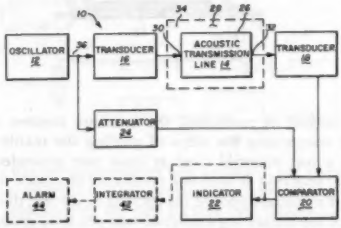


4,055,072

APPARATUS FOR MEASURING A SORBATE DISPERSED IN A FLUID STREAM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Otis L. Updike, Charlottesville, Va.

Filed Sept. 19, 1975, Ser. No. 615,030
Int. Cl.[2] G01N *31/06*
U.S. Cl. 73—23 **13 Claims**



1. Apparatus for measuring a sorbate dispersed in a fluid stream comprising:

a signal source means for generating an alternating-current signal;

acoustic transmission line means for disposition in the fluid stream and including an elongated body having a surface capable of sorbing an amount of a first sorbate to be measured representative of the concentration thereof in the fluid stream, said body being capable of propagating acoustic energy along its length from one end portion to another end portion, the propagated acoustic energy being damped in amplitude and shifted in phase such that the change in amplitude or phase is proportional to the amount of sorbate sorbed by said surface;

first transducing means for converting said alternating current signal to acoustic energy and for applying said acoustic energy to said one end portion;

second transducing means for converting the acoustic energy propagated to said other end portion to a corresponding first electrical signal; and

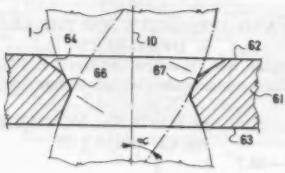
comparator means for comparing said first electrical signal to said alternating current signal and for developing an output signal corresponding to a difference therebetween, said output signal being indicative of the concentration of the sorbate in the fluid stream.

4,055,073

DRAWING DIE FOR ELONGATED TWIST BODIES

Oldrich Langr, Tesetice, Czechoslovakia, assignor to Sigma Lutin, narodni podnik, Lutin, Czechoslovakia

Filed Sept. 16, 1976, Ser. No. 723,787
Int. Cl.[2] B21C *3/04*
U.S. Cl. 72—467 **3 Claims**



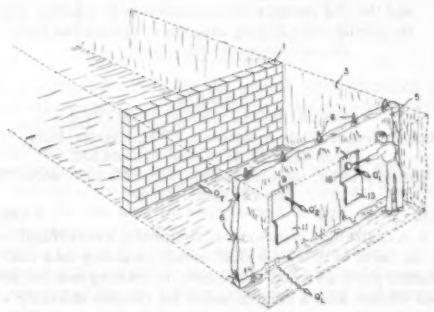
1. In a drawing die for forming an elongated twist body during relative axial and angular movement of the die and a body-forming blank, the body having a prescribed non-circular cross-section, twist angle and axial pitch, the prescribed cross-section varying axially along the body in a spiral of constant radius, the drawing die having upstream and downstream axially spaced end surfaces and centrally disposed, orifice-defining means extending therebetween, the orifice-defining means having an interior forming portion whose cross-section corresponds to the prescribed cross-section of the twist body, the improvement wherein the cross-section of the orifice-defining means varies regularly along the die in a direction from the interior forming portion toward the upstream end surface in a spiral of increasing radius terminating at the upstream end surface.

4,055,074

WINDOW METHOD FOR MEASURING LEAKAGE

Edward D. Thimons, Natrona Heights; Robert P. Vinson, Pittsburgh; Fred N. Kissell, Pittsburgh, and Albert Tall, Pittsburgh, all of Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 30, 1976, Ser. No. 755,916
Int. Cl.[2] G01M *3/26*
U.S. Cl. 73—40 **6 Claims**



1. A method for measuring fluid leakage past a first barrier comprising the steps of:

a. setting up a test stopping barrier near the first barrier whose leakage is to be measured, said barrier having two windows therein capable of being opened or closed;

b. measuring the fluid flow rate through the first of said opened windows while the second window remains closed; measuring the fluid flow rate through the same first window with both windows open; measuring the fluid flow rate through the second window when both windows are opened; and

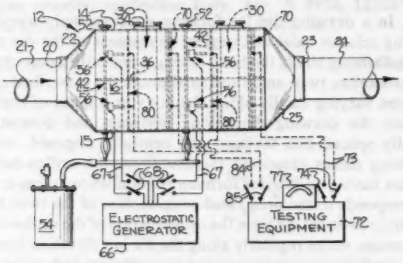
c. calculating the total fluid flow leakage past the first barrier under observation based upon the three foregoing measurements.

4,055,075

METHOD AND APPARATUS FOR THE LEAK TESTING OF FILTERS

Thomas T. Allan, San Francisco, and David E. Wilcox, Millbrae, both of Calif., assignors to Flanders Filters, Inc., Washington, N.C.

Filed Apr. 8, 1976, Ser. No. 675,076
Int. Cl.[2] G01M *3/20*
U.S. Cl. 73—40.7 **34 Claims**



1. A method for testing for leakage of particles of predetermined size through or around an air filter which is sealably mounted within a housing, and characterized by the ability to substantially uniformly disperse the particles across the entire area of the upstream face of the filter from a point relatively close to the filter, and comprising the steps of

passing an airstream through the housing and filter,

distributing particles of predetermined size into the airstream within the housing and upstream of the filter, and while imparting a like electrical charge to the particles such that the particles repel each other and substantially uniformly disperse within the airstream, and while

monitoring the airstream on the downstream side of the filter to detect at least a portion of any particles in the airstream and thereby permit a determination as to whether any of the particles are leaking through or around the filter.

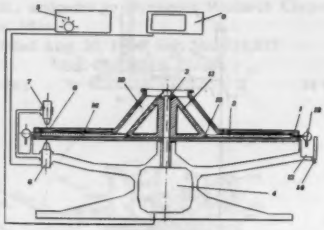
4,055,076

CENTRIFUGAL GRANULOMETER

Michele Tropea, Viale A. Alagona, 27/H, Catania, Italy

Filed Mar. 22, 1976, Ser. No. 668,852
Claims priority, application Italy, Mar. 21, 1975, 6606/75
Int. Cl.[2] G01N *15/04*
U.S. Cl. 73—61.4 **7 Claims**

1. A centrifugal granulometer comprising a centrifugal rotor in the form of a hollow disc, means mounting said disc for rotation about a vertical axis, means for rotating said disc about said vertical axis, a cone mounted for rotation coaxially with said disc, the base of the cone comprising the radially inner edge of a single flat continuous annular chamber within said disc, the disc having a single translucent continuous annular peripheral zone, means to project a light beam through said translucent zone, and photoelectric means to determine and record the intensity of said beam which has passed through said zone as a function of time, said cone comprising the inner wall of a frusto-conical feed passage for a specimen whose granulometry is to be determined, the lower edge of said feed



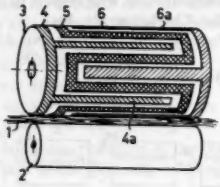
passage opening into the inner edge of said annular chamber entirely about said inner edge.

4,055,077

METHOD AND APPARATUS FOR THE MOISTURE MEASUREMENT OF TEXTILE WEBS

Ernst Loch, Uster, Switzerland, assignor to Zellweger Uster AG, Uster, Switzerland

Filed Aug. 16, 1976, Ser. No. 714,846
Claims priority, application Switzerland, Oct. 2, 1975, 12780/75
Int. Cl.[2] G01N *27/04*
U.S. Cl. 73—73 **9 Claims**



1. A method of measuring the moisture content of textile material, comprising the steps of guiding the textile material forming a test material over at least one grounded-ground electrode, applying at least one measuring electrode to the side of the test material opposite the ground electrode, dividing the surface of the measuring electrode into positive, grounded and negative regions, and measuring the conductivity of the textile material between the ground electrode and the measuring electrode.

4,055,078

STRAIN TRANSDUCER

Nicholas F. D'Antonio, 7695 Admiral Drive, Liverpool, N.Y. 13088; Richard L. Bates, 125 Hillside Way, Camillus, N.Y. 13031, and Richard W. French, 609 Vine St., Liverpool, N.Y. 13088

Filed July 1, 1976, Ser. No. 701,649
Int. Cl.[2] G01L *1/22*
U.S. Cl. 73—88.5 R **10 Claims**

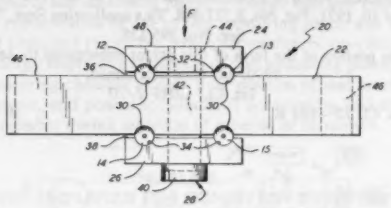
1. A transducer comprising:

a plurality of impedance devices connected together to form an electrical circuit, the impedances of said devices varying in response to the application of force to said devices, said circuit generating an output signal in response to the application of an electrical potential across said circuit, the value of said output signal depending upon the difference in impedance between said devices;

pre-stressing means for applying predetermined force to said impedance devices to effect first impedance characteristics in said circuit;

force transmitting means for transmitting input forces to a portion of said impedance devices to vary the impedances in said portion of said devices; and

force relieving means for reducing the predetermined force on the remainder of said impedance devices in conjunction with the transmission of force by said force transmitting means to said portion of said devices, for increasing the difference between the impedances of said portion of said devices and said remainder of said devices, to effect a strong output signal when an electrical potential is connected across said circuit.

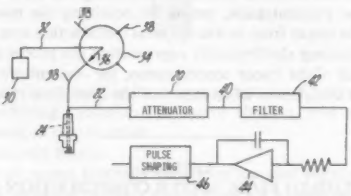


4,055,079

CYLINDER FIRING INDICATOR

Thaddeus J. Dudziak, Nashua, N.H., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 9, 1976, Ser. No. 712,630
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—117.3 **1 Claim**



1. In a cylinder compression test apparatus for a spark ignition engine: improved circuit means for generating an electrical pulse representing the firing cycle in a selected cylinder, said pulse-generating means comprising a signal attenuator having a hardwire connection to the high tension electrode in the spark plug for the selected cylinder, said attenuator having an output signal voltage whose magnitude is approximately one-tenth of 1 percent of the high tension voltage; a low-frequency-pass filter receiving the output of the attenuator, said filter having a capability for rejecting the attenuated highest voltage spike generated in the high tension electrode, while passing the attenuated high tension steady state signal occuring during the cylinder fire period; the filter output being essentially a pulse having a width that is approximately the same as the duration of the cylinder fire signal, whereby said pulse, after additional filtering and conditioning is suited to act as a trigger means for a digital-logic element, e.g. a flip-flop.

4,055,080

TORQUING APPARATUS

Emory W. Farr, 649 Jalapa Drive, Covina, Calif. 91724, and Robert D. Greene, 267 Renoak Way, Arcadia, Calif. 91006

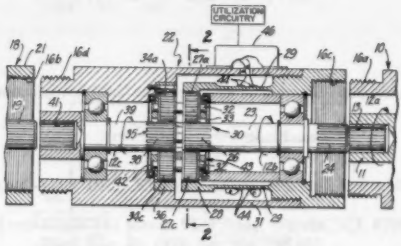
Filed Nov. 11, 1974, Ser. No. 522,599
Int. Cl.[2] B25B *23/14*
U.S. Cl. 73—139 **6 Claims**

1. In combination with a power wrench and a wrench attachment therefor, the improvement comprising:

an insertable/removable torquing unit adapted to be inserted between said wrench and said attachment;

means for removably attaching said torquing unit in an in-line relation with said power wrench;

said torquing unit having a power transmitting train means for transmitting power from said wrench, through said insertable torquing unit, to said attachment;



said power transmitting train of said insertable torquing unit comprising a gear system having a 1:1 input/output arrangement;

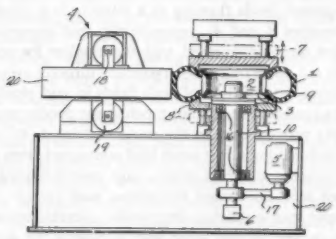
whereby said power transmitting train may transmit torque from said power wrench to a work piece.

4,055,081

METHOD AND APPARATUS FOR IMPROVING THE RIDE CHARACTERISTICS OF MOTOR VEHICLE WHEELS

Herwig Hönlinger, Jugenheim an der Bergstrasse, Germany, assignor to Gebr. Hofmann KG, Maschinenfabrik, Darmstadt, Germany

Filed Feb. 24, 1977, Ser. No. 771,690
Claims priority, application Germany, Apr. 6, 1976, 2614852
Int. Cl.[2] G01M *17/02*
U.S. Cl. 73—146 **6 Claims**



1. A method for reducing the smooth road vibrations of motor vehicles having a wheel rim and a tire mounted on said rim, comprising the steps of:

rotating the rim and tire in a first measuring run;

measuring the amplitude and angle of the first forces of reaction of the rim and tire produced during said first run;

rotaing the rim and tire with respect to each other by a predetermined angle;

rotating the rim and tire in a second measuring run;

measuring the amplitude and angle of the second forces of reaction of the rim and tire produced during said second run;

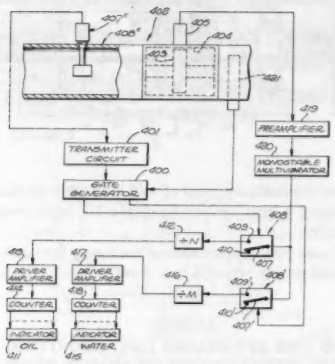
at least when the vibrations can be corrected by more than a predetermined amount, calculating the offset angle between tire and rim to reduce vibrations from said measured first and second forces; and

rotating said rim and tire with respect to each other to said offset angle.

4,055,082
NET OIL COMPUTER

Milton H. November, Hacienda Heights, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,583
Int. Cl.[2] G06G 7/75; G01F 1/00
U.S. Cl. 73—194 R 6 Claims



1. A net oil computer or the like for producing an output directly proportional to the total volume flow of at least one of first and second fluids flowing as a mixture in a pipeline and having densities d_o and d_w, respectively, said computer comprising: first means connected with the pipeline for producing first pulses at a pulse repetition frequency directly proportional to the volume rate of flow of both fluids in said pipeline; second means connected with the pipeline for producing an output directly proportional to the mean density d_m of said mixture; a switch having a first input lead connected from said first means to receive said first pulses, said switch having at least one output lead connected therefrom, said switch having a second input lead and being electrically operable upon receipt of a pulse on said second input lead to change the connection between the first input and the output lead of said switch; and third means connected from said second means to receive the output thereof and adapted to impress second pulses on the second input lead of said switch of a pulse width directly proportional to one of the time periods T_o and T_w, where

$$T_o = [K]\left[\frac{\pm d_w \mp d_m}{\pm d_w \mp d_o}\right],$$

$$T_w = [K]\left[\frac{\pm d_m \mp d_o}{\pm d_w \mp d_o}\right],$$

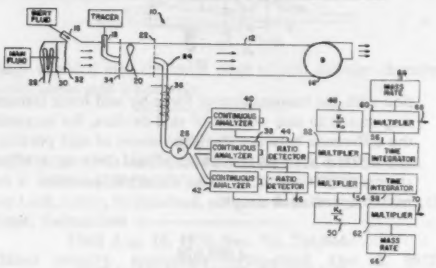
and K is a constant,

said third means causing said first pulses to be passed and interrupted alternately from the first input lead to the output lead of said switch.

4,055,083
CHEMICAL TRACER METHOD OF AND STRUCTURE FOR DETERMINATION OF INSTANTANEOUS AND TOTAL MASS AND VOLUME FLUID FLOW

Rudy M. Haas, 8171 Forestlawn, Detroit, Mich. 48234

Continuation-in-part of Ser. No. 349,622, April 9, 1973, Pat. No. 3,988,926, which is a continuation-in-part of Ser. No. 141,749, May 10, 1971, Pat. No. 3,727,048. This application Sept. 7, 1973, Ser. No. 395,135
The portion of the term of this patent subsequent to Apr. 10, 1990, has been disclaimed.
Int. Cl.[2] G01F 1/70
U.S. Cl. 73—194 E 20 Claims

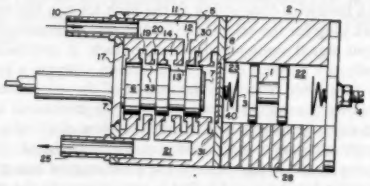


1. Structure for determining mass flow rate of at least one component of interest of a flowing fluid mixture which comprises a main fluid and a tracer over a period of time comprising means for introducing a tracer into the main fluid at a known mass rate, means for analyzing the resulting fluid mixture for the tracer concentration and at least one component of interest concentration, means for providing the reciprocal of the tracer concentration, means for obtaining the mass flow rate of the tracer from its known mass introduction rate, means for multiplying electronically representing the product of the reciprocal of the tracer concentration, the concentration of at least one component of interest and the mass flow rate of the tracer.

4,055,084
LIQUID FLOW METER CONSTRUCTION

Hans Wilde, Bubenhalde 92, Stuttgart 30, Germany (D-7000)

Filed July 8, 1976, Ser. No. 703,584
Int. Cl.[2] G01F 11/14
U.S. Cl. 73—249 12 Claims



1. A liquid flow meter comprising, in combination, a measuring chamber; a measuring member reciprocable in said measuring chamber between two limit position; a control chamber having an inlet and outlet for the liquid to be measured; a control slide reciprocable in said control chamber and formed with control passages for the measured liquid; passage means interconnecting said measuring and control chambers so that the liquid to be measured flows, under dynamic pressure, from said inlet through said control passages and through said measuring chamber to reach said outlet; said control slide being movable between two end positions in each of which said control passages direct fluid under dynamic pressure to a

different respective end of said measuring member to reverse the movement of said measuring piston; said control slide, when said measuring piston is stopped in either of its limit positions with said control slide in one of its end positions, being moved, under the effect of the dynamic pressure of the measured liquid, to its opposite end position to effect reverse movement of said measuring piston; a counter operable responsive to reciprocation of one of said measuring piston and said control slide; and respective power accumulators, operable to store energy responsive to motion of said measuring piston, in said measuring chamber at each limit position of said measuring member, said power accumulators accelerating said measuring member during initiation of reversal of its motion.

4,055,085

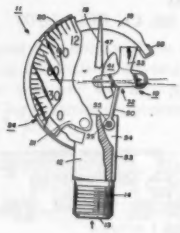
MOTION AMPLIFIER FOR CONDITION RESPONSIVE GAUGE INSTRUMENT

Richard Harry Wetterhorn, Fairfield, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 413,483, Nov. 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 186,120, Oct. 4, 1971, abandoned. This application July 26, 1976, Ser. No. 708,510

Int. Cl.² G01L *7/04*

U.S. Cl. 73—418 **8 Claims**



1. A motion amplifier for a gauge instrument having a motion producing condition responsive element, said amplifier comprising in combination:

a. a support frame;

b. pivot means pivotally supported on said support frame and including receiver means in which to receive an actuator operably connected to the condition responsive element for pivoting said pivot means in correlation to the motion produced by said element;

c. mounting means adapted for mounting said support frame and said pivot means as a unit on a stationary portion of the gauge instrument; and

d. calibration means adjustable to displace said unit on said mounting means relative to the received actuator for effecting presettable operational accuracy of the amplifier.

4,055,086

DEVICE AND METHOD FOR OBTAINING ONE OR MORE SAMPLES OF LIQUID

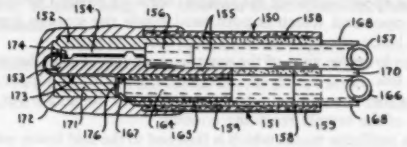
William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

Division of Ser. No. 543,687, Jan. 24, 1975, Pat. No. 4,002,071. This application Feb. 9, 1976, Ser. No. 656,660

Int. Cl.² G01N *1/12*

U.S. Cl. 73—425.4 R **9 Claims**

1. In combination: a pair of devices disposed in a side-by-side relation, one of said devices comprising: a head forming a relatively large chamber and the other device an elongated chamber, tubular means communicating with each of said chambers and having a free extremity extending outwardly therefrom for entry into a supply of molten metal; means for holding said devices in said relation, means common to said extremities for supporting the same, an appendage having portions respectively disposed in relation to said chambers whereby when molten metal is received in said chambers it will engage and fasten itself to said portions of said appendage



for connecting solidified samples of metal formed in said chambers.

4,055,087

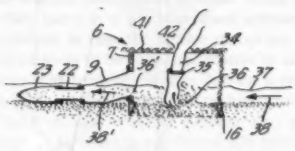
AQUATIC-LIFE DEPLETION-SAMPLING DEVICE AND TECHNIQUE

Frank Louis Carle, 146 Mount View Road, Warren, N.J. 07060

Filed Nov. 30, 1976, Ser. No. 746,083

Int. Cl.² G01N *1/12*

U.S. Cl. 73—421 R **12 Claims**



1. An aquatic life sampling device comprising in combination: a vessel structure having substantially upright circumscribing walls forming a substantially downwardly-facing open bottom and forming an upper-opening in an upper portion thereof, an upper-opening closure means for normally closing the upper-opening and for intermittently gaining access to enclosed space within the circumscribing walls, at least forwardly-located portions of the circumscribing walls comprising fine meshed screen and rearwardly-located portions of the circumscribing walls including a barrier plate having a through-passage outlet port formed therein, a funnel element having a forward structure thereof forming an enlarged inlet and a rearward structure thereof forming a narrowed outlet, the forward structure being attached and sealed to said rearwardly-located portion with said enlarged inlet being aligned in flow-communication with said outlet port, and bag-fastening means for mounting an open-mouthed porous sample bag on said rearward structure in flow communication with said narrowed outlet into an open mouth of the mounted sample bag.

4,055,088

APPARATUS FOR SAMPLING DRY SOLIDS

Edward M. Diss, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 4, 1976, Ser. No. 729,328

Int. Cl.² G01N *1/20*

U.S. Cl. 73—424 **5 Claims**

1. An apparatus for sampling a stream of dry, free-flowing solids at a point between a classifier means and a packaging means, the apparatus including:

a hopper which is suitable for storing dry, free-flowing, solids, and which includes a top wall with an opening therein;

a delivery conduit which communicates with a means for classifying the dry solids and with the top wall opening, and which is suitable for carrying a stream of the dry solids from the classifier means to the storage hopper;

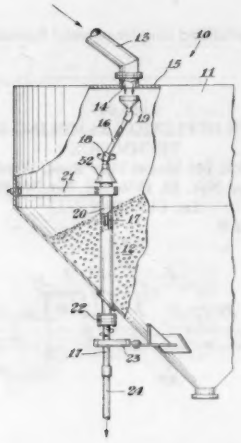
a sample receiving conduit which includes an upper section and a lower section which is coupled to the upper section;

the upper section of the sample receiving conduit having an open end which is positioned inside the storage hopper below the opening in the top wall;

the lower section of the sample receiving conduit having a lower end which extends outside the storage hopper;

a collection conduit which connects into the said lower end of the sample receiving conduit;

an oscillator means which is fastened to the said lower end of the sample receiving conduit, the oscillator being adapted



for moving the sample receiving conduit to a first position in which the open end of the upper section is in direct alignment with the opening in the top wall of the hopper, and a second position in which the said open end is not aligned with the opening in the top wall of the hopper;

a support column which is positioned inside the hopper, which is fastened to the hopper, and which encloses the lower section of the sample receiving conduit;

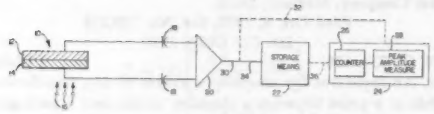
a bearing assembly which is fitted to the lower section of the sample receiving conduit near the point at which the said lower section is coupled to the upper section of the sample receiving conduit.

4,055,089

SEMICONDUCTOR PROJECTILE IMPACT DETECTOR

Edward L. Shriver, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 11, 1976, Ser. No. 665,734
Int. Cl.² G01L *1/14*
U.S. Cl. 73—432 R **4 Claims**



1. A method for investigating the nature of hypervelocity particles comprising the steps of:

a. introducing a coverless solid-state photovoltaic cell into an environment containing said particles;

b. measuring the peak amplitude of voltage pulses developed across the cell in response to the particles impacting thereon; and

c. counting the number of pulses produced by the cell.

2. Apparatus for investigating the nature of hypervelocity particles comprising:

a. a coverless, solid-state, two-terminal photovoltaic cell responsive to the impact thereon of a hypervelocity particle for generating a voltage pulse across the terminals proportional to the kinetic energy of the impacting particle.

b. a counter responsive to the terminal voltage of the cell for counting the number of voltage pulses produced by the cell as a consequence of impacting particles; and

c. peak amplitude measuring means responsive to the terminal voltage of the cell for measuring the peak value of the voltage pulses reduced by the cell as a consequence of impacting particles.

4,055,090

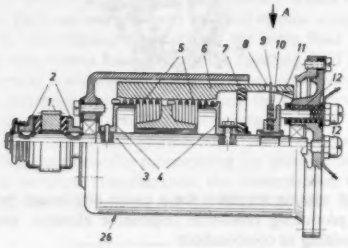
SENSOR

Werner Karl Heinz Fuchs, Sedlmayrstr. 14, 8 Munich 19, Germany

Continuation-in-part of Ser. No. 412,685, Nov. 5, 1973, abandoned, which is a continuation-in-part of Ser. No. 185,130, Sept. 30, 1971, abandoned. This application June 27, 1975, Ser. No. 670,350

Claims priority, application Germany, Oct. 5, 1970, 2048802; July 6, 1973, 2334493

Int. Cl.² G01P *15/00*
U.S. Cl. 73—510 **18 Claims**



1. A sensor which measures and automatically compares the wheel angular deceleration with the vehicle linear deceleration on a vehicle with wheels, comprising:

a housing,

a shaft journaled in the latter and arranged parallel to the longitudinal axis of the vehicle and connected with at least one of the vehicle wheels in order to be driven proportionally to the wheel speed of rotation,

a mass, which can move in an axial direction and independently of this also in a rotary direction on the shaft,

elastic means interposed between said shaft and said mass elastically supporting said mass upon said shaft for relative movement thereto,

magnetic conductive helical teeth on said mass extending in the same direction in which the mass freely moves relative to the shaft when the ratio of wheel periphery deceleration to the vehicle linear deceleration remains constant, whereby as a result of the wheel angular deceleration the mass twists relative to the shaft and — independently of the twisting — there is an axial displacement as a result of the vehicle linear deceleration,

a toothed gear which is fixed on said shaft and magnetically isolated from it in order to serve as a non-contacting inductive sensing means,

an iron core attached to said housing in order to conduct a magnetic flux through the toothed gear and the teeth of the mass, and

a coil on the iron core in order to measure the magnetic reluctance between the toothed gear and the mass and provide the measured value when the ratio of angular

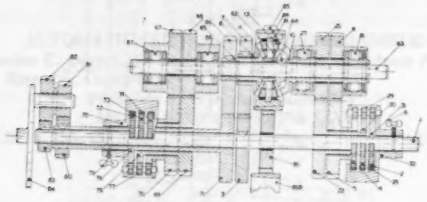
deceleration to linear deceleration exceeds a predetrmined quantity.

4,055,091

VARIABLE OUTPUT TRANSMISSION

John Hugh Kerr, Kitchener, Canada, assignor to Ker-Train Systems N.V., Curacad, Netherlands Antilles

Division of Ser. No. 390,454, Aug. 22, 1973, abandoned. This application Nov. 24, 1975, Ser. No. 634,683
Claims priority, application Canada, Aug. 31, 1972, 150683
Int. Cl.[2] F16H *35/02, 37/06, 1/38*
U.S. Cl. 74—394 **3 Claims**



1. An inverted-gear-train-loop with the first gear-element of said loop consisting of identical driver-gears of two sets of variable-ratio-gears with said sets incorporating the embodiments as specified for square-wave-generator elements:

Driven Gear	$\frac{x+y}{x}$ $\frac{\text{Teeth}}{\text{Voids}}$
Driver Gear	$\frac{x}{x+y}$ $\frac{\text{Teeth}}{\text{Voids}}$
A/B Ratio	between 1 and 4
Asymmetry Ratio	between .5 and .95
Bias Ratio	between $-.2$ and $+.2$
Cyclical Ratio	between 1/10 and 10
Cycle Ratio	between 1/10 and 10/1

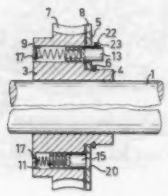
with one of said driver-gears affixed to a first shaft together with a common-spur-gear control-element, with the second driver-gear affixed to a tubular shaft together with a second identical common-spur-gear control-element, with said tubular shaft concentrically mounted between the one driver-gear and control-element of said first shaft; concentrically mounted and free to rotate on said first shaft adjacent to said control-element is a control cage incorporating a plurality of double-spool gear-elements with one spool having one less tooth than the other, with said spool with one less tooth congruent to said one control-element affixed to said first shaft, and with said spools with one more tooth congruent to said control-element affixed to said tubular shaft, so that, when said control cage is rotated with said tubular shaft held relatively fixed, said first control-element together with said first shaft and said one driver-gear will be caused to rotate relative to said second driver gear affixed to said tubular shaft; with the second gear-element of said inverted-gear-train-loop consisting of identical driven-gears of said two sets of variable-ratio-gears, to which are affixed the bevel gears of a differential-gear-train, said differential-gear-train also having a carrier and at least one pinion, with the carrier and pinions of said differential-gear-train affixed to a third shaft with an end thereof extended to form the inner race of an overrunning clutch, with the outer race of said overrunning clutch together with the third spur-gear-element of said inverted-gear-train-loop affixed to a fourth shaft co-axially mounted with said third shaft; and congruent to said third spur-gear-element is the last spur-gear-element of said inverted-gear-train-loop, to which is affixed a fifth shaft co-axially mounted with said first shaft.

4,055,092

SAFETY DEVICE FOR GEAR WHEELS

Martin Birger Aberg, 137 Morrison Road, Oakville, Ontario, Canada

Filed Nov. 12, 1976, Ser. No. 741,496
Claims priority, application Sweden, Nov. 13, 1975, 7512752
Int. Cl.[2] F16H *55/12, 55/18, 1/16, 55/00*
U.S. Cl. 74—439 **11 Claims**



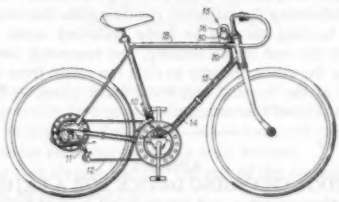
1. A safety device for use with a toothed wheel structure whose teeth engage a toothed element arranged to trip a protection device when a tooth of the toothed wheel structure is broken or when there is a predetermined amount of tooth wear, characterized in that the device comprises a tripping element mounted so as to be rotatable relative to said toothed wheel structure said tripping element having a rim of teeth with the same pitch as the teeth of said toothed wheel structure so that the teeth of said tripping element also engage the toothed element or an element synchronically movable therewith, and signalling means responsive to relative rotary movement between said tripping element and said toothed wheel structure for tripping a protection device when there is rotary movement between said tripping element and said toothed wheel structure beyond a given angle.

4,055,093

10-SPEED BICYCLES

Haldon Ross, Olney, Ill., assignor to AMF Incorporated, White Plains, N.Y.

Filed June 18, 1976, Ser. No. 697,314
Int. Cl.[2] B62M *9/00;* **F16H** *9/00, 7/22*
U.S. Cl. 74—501 R **4 Claims**



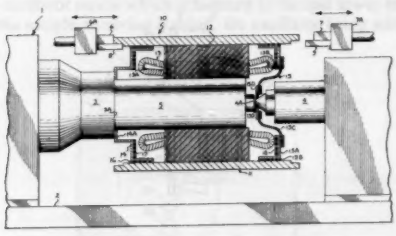
1. In a 10-speed bike having front and rear derailleur mechanisms, and a pair of movable cables connected at one of their ends to different ones of said mechanisms for controlling the same, the improvement of a single manual control for all 10 speeds of said bike, said improvement comprising a pair of 10-station cams mounted on a common shaft, a pair of cam follower mechanisms engaged with said cams and having the other ends of said cables connected thereto, and a single manual member for rotating said shaft to move said cams in unison, and an indicator for all 10 speeds of said bike.

4,055,094

METHOD FOR PROTECTING STATOR WINDINGS OF DYNAMOELECTRIC MACHINE

Curtis M. Menke, Hendersonville, Tenn., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,450
Int. Cl.[2] B23B 1/00
U.S. Cl. 82—1 C 9 Claims



1. A method for protecting the stator winding of a dynamoelectric machine from metal fragments while machining the housing of the machine, comprising the steps of:

a. providing a lathe having; a rotatable headstock arbor, a tailstock reciprocally mounted coaxially with said arbor, and at least one cutting tool movably supported radially outward from said arbor,

b. mounting a shield closely around part of the arbor for rotation therewith,

c. supporting on the arbor for rotation therewith a dynamoelectric machine housing having a stator and stator winding assembly mounted therein spaced from the ends of the housing, said housing being supported to position said shield at least partially within one end of the housing with the peripheral surface of the shield in snug engagement with an inner circumferential surface housing at a point thereon outward from one end of said winding assembly,

d. placing a flexible diaphragm within the other end of the housing with the peripheral surface of the diaphragm positioned snugly against an inner circumferential surface of the housing outward from the other end of the winding assembly,

e. moving the tailstock against the central portion of the diaphragm to secure it in operating position for rotation with the housing,

f. adjusting the cutting tool and rotating the housing supported on the arbor thereby to machine at least one end of the housing, said cup-shaped shield and said diaphragm being effective during said machining operation to prevent metal particles from entering said stator winding,

g. withdrawing the tailstock, removing the diaphragm from the housing thereby to force collected metal particles from one end of the housing, and removing the housing from the arbor, thereby to slide the shield from the other end of the housing and force metal particles from said other end of the housing.

4,055,095

TOOL CHANGING DEVICE FOR A LATHE

Herbert Gramespacher, and Armin Feisel, both of Schaffhausen, Switzerland, assignors to Georg Fischer Aktiengesellschaft, Switzerland

Filed Mar. 16, 1976, Ser. No. 667,352
Claims priority, application Switzerland, Mar. 27, 1975, 3934/75
Int. Cl.[2] B23B 29/00; B23Q 1/00; B23B 39/20
U.S. Cl. 82—36 A 5 Claims

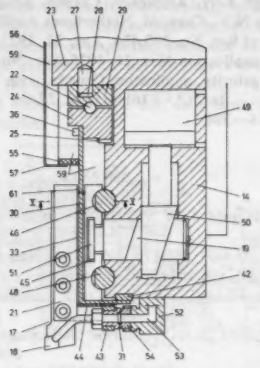
1. Tool changing apparatus for use on a lathe of the type having a base structure, longitudinal guide means and means for holding a workpiece for rotation about an axis, the apparatus including the combination comprising

a plurality of tool holders each one adapted to hold a tool;

a tool magazine for replaceably supporting said plurality of tool holders in an unclamped condition;

a cross slide member slidably mounted on the longitudinal guide means of said lathe;

means for mounting said tool magazine on said cross slide, said magazine being movable to cause each tool and tool



holder to follow a curvilinear path so that any one of said tools can selectively be moved to a working position adjacent the workpiece lying adjacent said path; and

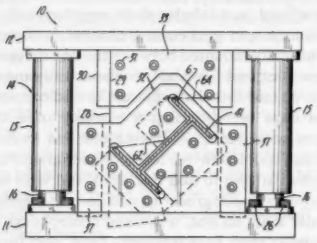
means on said cross slide for establishing a rigid and direct connection between any selected one of said tool holders and said cross slide when said selected tool holder is moved through said path to said working position while said tool holder remains on said magazine.

4,055,096

DIE SET FOR CUTTING I-BEAM

Alexander Borzym, Dearborn, Mich., assignor to Alpha Industries, Inc., Detroit, Mich.

Filed June 7, 1976, Ser. No. 693,170
Int. Cl.[2] B23D 25/02; B26D 1/56
U.S. Cl. 83—37 9 Claims



1. A method of cutting off an I-beam comprising simultaneously cutting through the beam with a stepped cutting blade having two blade cutting edges, one edge trailing the other edge, said blade moved at an acute angle to the planes of the web and flanges and substantially perpendicularly to the longitudinal axis of the beam in which said leading blade edge cuts through one flange and approximately half of the web of the beam and said trailing blade edge cuts through the other flange and the remainder of the web of the beam.

5. A die set for use in combination with a press or the like for severing structural sections of predetermined configuration having a web and having a flange extending transversely to the web fixed on each edge of the web, the die set comprising a frame defining a guide slot directed transversely of the section and at an acute angle to the plane of the web; a movable cutting

blade reciprocable in the slot through a cutting stroke having a cutting edge movable across the section to sever the section; and fixed blade support means underlying the web and flanges in position to support the section against the thrust of the movable blade; the said cutting edge having two cutting portions offset from each other in the direction of movement of the blade each adapted to sever respective parts of the section, the cutting portions each extending approximately at a right angle to the direction of movement of the blade, and one portion being in advance of the other portion so that the said one portion engages the web and one flange of the section substantially at the same time the other portion engages the other flange during the cutting stroke.

4,055,097

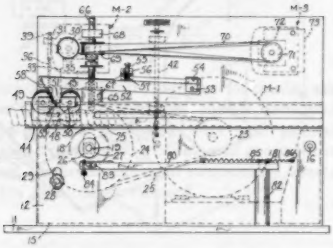
AUTOMATIC CUTTER FOR ARMORED CABLE

Lucien C. Ducret, c/o Seatek Co., Inc., 1156 E. Putnam Ave., Riverside, Conn. 06878

Filed July 9, 1976, Ser. No. 703,779

Int. Cl.[2] B23D *45/04*; B27B *5/20*

U.S. Cl. 83—169 **9 Claims**



1. An armored cable cutting machine comprising, a base, cable guiding and holding means supported on said base, a carriage mounted on said base for pivotal movement about a horizontal axis, a circular saw carried by the carriage, a motor on the carriage for driving the saw, and carriage moving means including a carriage feed motor supported on the base, a cam on a cam shaft and driven by the feed motor, a toggle linkage system having one link journaled on the cam shaft and another link connected to the carriage, and resilient means cooperating with said links to bias the carriage toward cutting position.

4,055,098

MANUFACTURING CORRUGATED PERFORATED PLASTIC TUBES

Arnoldus Willem Jan Leloux, Dedemsvaart, Netherlands, assignor to Wavin B.V., Netherlands

Division of Ser. No. 487,201, July 10, 1974, Pat. No. 3,965,782. This application Nov. 25, 1975, Ser. No. 635,175

Claims priority, application Netherlands, July 16, 1973, 7309844

Int. Cl.[2] B26F *1/18*

U.S. Cl. 83—309 **5 Claims**

1. A device for forming perforations in a corrugated plastic tube, comprising:

guide means for supporting said corrugated plastic tube;

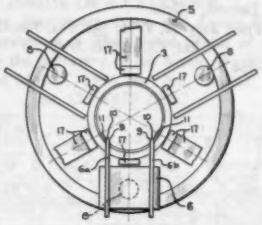
a plurality of punching members, at least two of said punching members being substantially parallel and spaced in close proximity to each other;

operating means for activating said punching members;

means for preventing deformation of said tube;

conveying means for conveying said tube to be perforated;

said operating means simultaneously activating said at least two substantially parallel spaced punching members; and said at least two substantially parallel spaced punching members being disposed in a plane which is oriented substantially transverse to the longitudinal axis of said conveying means.



4,055,099

FOOD SLICER

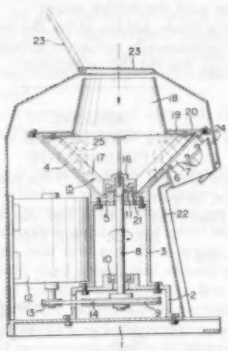
Yoshihiko Mitsubayashi, Kuwana, Mie, Japan, assignor to Chubukoki Kabushiki Kaisha, Kuwana, Mie, Japan

Filed Feb. 24, 1976, Ser. No. 660,924

Claims priority, application Japan, Feb. 28, 1975, 50-28200[U]; June 5, 1975, 50-67773

Int. Cl.[2] B26D *7/06*; B02C *17/02*; B07B *13/00*

U.S. Cl. 83—403 **2 Claims**



1. A slicer for foodstuffs, comprising

a. an upwardly diverging conical case with a slot in an upper part thereof for discharging sliced foodstuff and with a recess for receiving a bearing at its bottom;

b. a flat ring attached to the top end of the conical case to cover its upper portion;

c. a cutting blade attached to the conical case at a portion of the case above said slot to slice lumps of foodstuff;

d. a rotor assembly consisting of a downwardly diverging hopper as an upper member, a plurality of carrier-arms as intermediate members and a boss as a bottom-member, the hopper being provided with an outwardly extending wide flange at its bottom, and the carrier-arms being connected at their top-ends and at the bottom ends to the said flange and said boss, respectively; and

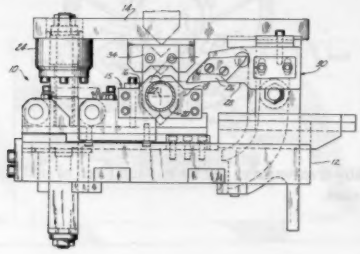
e. a vertical shaft connected to the rotor and its driving means including an electric motor.

4,055,100

SEVERING KNIFE FOR TUBE CUTOFF APPARATUS

Alexander Borzym, Dearborn, Mich., assignor to Alpha Industries, Inc., Detroit, Mich.

Filed July 12, 1976, Ser. No. 704,420
Int. Cl.[2] B26D *5/42*
U.S. Cl. 83—454 **2 Claims**



1. In a tube cutoff apparatus of the type using a ram-driven shearing blade to sever a clamped workpiece:

holder means for said blade and comprising a clamping structure, said clamping structure mechanically interconnecting said holder means and blade and defining a pocket having support surfaces for the faces and sides of the blade, said support structure having vertically extending portions enveloping the edges of said blade when in the pocket and bounding a central upwardly recessed portion over which the faces of the blade are exposed;

workpiece clamping means adapted to receive and hold the workpiece to be severed, and having a central slot for permitting the blade to pass therethrough and through the workpiece;

the clamping means having a top surface which is matingly conjugate with the holder means

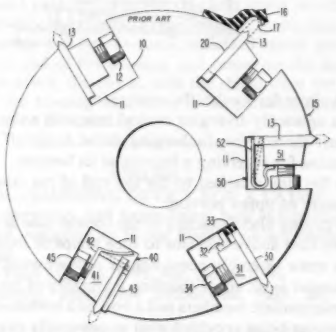
whereby the blade holder abuts the workpiece clamping means in substantially nesting relationship when the ram is fully driven toward the workpiece.

4,055,101

ROLL FED ROTARY WEB DEVICE WITH IMPROVED PERFORATOR

Joseph Martin Collins, Ontario, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 19, 1976, Ser. No. 687,806
Int. Cl.[2] B26F *1/20*
U.S. Cl. 83—660 **4 Claims**



1. A roll fed rotary web device, such as printing press or collator, having:

a roll feed station, and

a perforation station,

the perforation station having a perforation cylinder in which there is a longitudinal groove across the cylinder aligned with the axis of the cylinder,

at least one lug plate and fastening member located within the groove such that a perforation blade can be set between the lug plate and the side wall of the groove and the perforation cylinder,

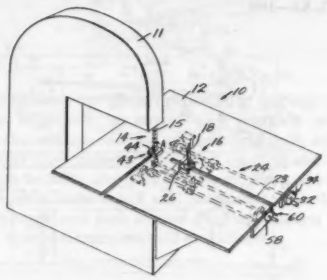
a support surface normally positioned to support an inserted perforation blade to increase strike-in position being provided to support the perforation blade above the bottom surface of said groove and between said lug and side wall of said groove, said support surface element being deformable by pressure applied to the perforation blade.

4,055,102

BAND AND SABER SAW ARRANGEMENT

James Henry Stubbings, Rockville, Md., assignor to Potomac Applied Mechanics, Inc., Bethesda, Md.

Filed Mar. 12, 1976, Ser. No. 666,172
Int. Cl.[2] B27B *11/00, 15/00*
U.S. Cl. 83—749 **10 Claims**



1. Apparatus for cutting sheet material and the like comprising:

a generally horizontally disposed table top,

a band saw having a toothed blade that is disposed in a generally vertical plane and passes through said table top,

a saber saw having a toothed blade that is adapted to be disposed in a generally vertical plane parallel to the vertical plane of said band saw blade, said saber saw blade passing through the table top when disposed in said generally vertical plane,

the teeth of said band and saber saw toothed blades being disposed on the same side of a vertical plane passing through said blades,

means for mounting said saber saw to adjust the horizontal spacing thereof from the vertical plane of said band saw blade, and

power means for operating said band saw and said saber saw, when in a generally vertical plane, at the same time so that a workpiece will have two parallel cuts made therein at the same time when brought into engagement with said saw blades.

4,055,103

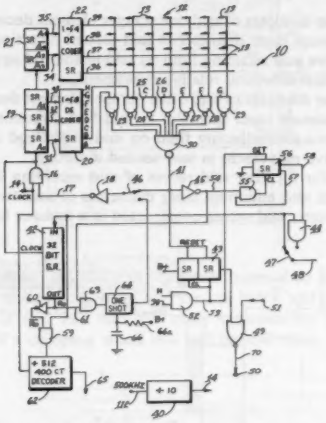
ELECTRONIC MUSICAL INSTRUMENT USING INTEGRATED CIRCUIT COMPONENTS

William V. Machanian, Lewiston, N.Y., assignor to The Wurlitzer Company, Chicago, Ill.

Continuation of Ser. No. 475,449, June 3, 1974, abandoned. This application July 26, 1976, Ser. No. 708,897
Int. Cl.[2] G10H *1/00, 5/06*
U.S. Cl. 84—1.01 **14 Claims**

1. In an electronic musical instrument the combination comprising: audio output means for reproducing different tones, generator means coupled to said audio output means for electronically generating signals corresponding to said tones, a

plurality of key switches, means for selectively manipulating each of said key switches for the selection of predetermined ones of said tones, circuit means including a ROM interconnected with said generator means and means for scanning such key switches to determine switch closures responsive to the



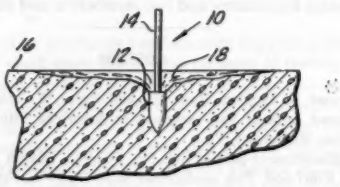
manipulation of particular key switches for causing said generator means to produce electronic signals corresponding to predetermined tones associated with said particular key switches, said circuit means causing said generator means to produce said electronic signals of substantially constant level until said key switches are released.

4,055,104

TIRE PIERCING MUNITION

Irving B. Osofsky, Rancho Palos Verdes, and Hugh C. Thompson, Anaheim, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 29, 1976, Ser. No. 671,083
Int. Cl.[2] F42B *13/00*
U.S. Cl. 89—1 A 10 Claims



1. A tire piercing munition for emplacement in concrete paving comprising:

a forward section having a sharp, hard, high strength point, said forward section of sufficient mass to be driven into and below the surface of said concrete paving when delivered with sufficient velocity or force, and

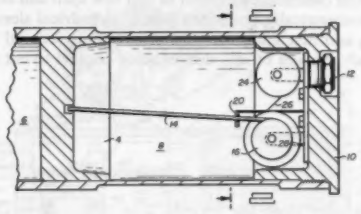
an aft section attached to said forward section comprising a smooth flexible shaft adapted to protrude above said concrete paving when the forward section has been emplaced in said paving, said shaft having a stiffness and cross-section sufficient to penetrate a pneumatic tire.

4,055,105

METHOD AND APPARATUS FOR VISUALLY LOCATING THE POSITION OF A FLOATING PISTON INSIDE OF A CYLINDER

Harold H. Wiese, Davenport, Iowa, and James E. Wildman, Moline, Ill., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 27, 1976, Ser. No. 691,047
Int. Cl.[2] F41F *19/02*
U.S. Cl. 89—43 R 3 Claims



1. A recuperator assembly of a recoil mechanism of a weapon system wherein said recuperator assembly includes a cylinder with a piston therein separating the interior of the cylinder into a high pressure fluid chamber and a high pressure gas chamber,

means adapted for visually displaying the interior of the gas chamber and indicating the position of the piston in the cylinder including

sight glass means carried by said cylinder for visually displaying the interior of said gas chamber to the exterior thereof,

said sight glass means comprising a window located in an end wall of said cylinder,

movable means in the gas chamber including a connection movable with said piston, said movable means being positioned for viewing through said sight glass means and being movably responsive to piston movement through said connection and,

indicia means on said movable means viewable through said sight glass means for indicating the position of said piston in said cylinder,

said movable means comprising spool means carried by said end wall of said cylinder and comprising first, second and third spools, said first and third spools being co-axial and movable with each other, said second spool being located at a distance from said first and third spools in vertical alignment with said third spool, said second spool being positioned with its surface located in the line of sight of said window and having indicia means carried thereby,

said connection comprising a cable carried at one end by said piston and wound on and attached at its other end to said first spool,

a constant force load spring attached to, carried by and wound partially on said second spool at one end thereof, said spring being attached, carried by and wound on said third spool.

4,055,106

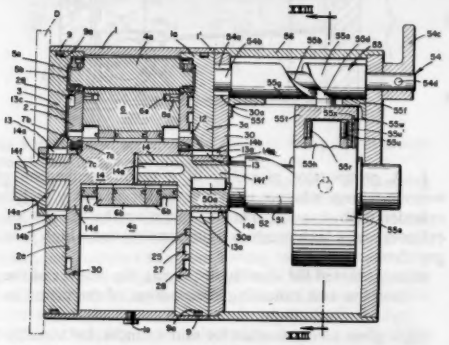
VARIABLE OUTPUT FLUID PUMP/MOTOR

Kenneth H. Frey, Hyattsville, Md., assignor to Edward A. Byrne; Gladys U. Byrne, Lorton; Robert B. Morrison and Patricia A. Morrison, Fairfax, all of, Va., part interest to each

Filed Nov. 29, 1974, Ser. No. 528,406
Int. Cl.[2] F01B *3/10, 3/00*
U.S. Cl. 91—495 43 Claims

1. In combination, a fluid pump/motor unit comprising a cylindrical housing within which there is arranged at least one rectangular expansible chamber assembly mounted on a crankshaft having at least a portion thereof which is adjustably

displaceable from the axis of the housing, each end of said displaceable portion being eccentrically mounted in the opposing ends of said housing, and means to supply and receive fluid to and from said unit, a power source having a connection to one end of said shaft, which connection is co-axial with said housing axis; and means coupled to said unit to control the output of said unit irrespective of the speed of said power source by varying said displacement of said shaft portion the control means comprising a housing connected at one end to said unit, a first shaft journaled in said housing and keyed to the end of the displaceable portion of the shaft in the pump/motor unit, a first camming unit keyed to said first shaft and comprising a concentrically positioned pair of cylindrical sleeves encircling said first shaft, the inner sleeve being secured to said first shaft, the axis of said sleeves being parallel to but spaced



from the axis of said first shaft each sleeve having a helical path in the wall of each, said helical paths lying at right angles to each other and forming a moving intersection of said paths so that the inner sleeve can be rotated counter to the rotation of the outer sleeve, means encircling said sleeves with means to engage said paths so as to rotate with said sleeves, a second camming unit holding said first camming unit in rotational relationship to said second unit and mounted on a second shaft in said controller unit housing, said second shaft being parallel to, but spaced from, said first shaft, means to restrain said second camming unit against rotational movement, said second camming unit including means for linear movement along said second shaft to move said encircling means over said sleeves to move said path engaging means along said paths to rotate said first shaft to vary said displacement of said shaft portion.

4,055,107

APPARATUS FOR REMOVING FLUID IN A PISTON CYLINDER ASSEMBLY

William W. Bartley, New Castle, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 533,092, Dec. 16, 1974, abandoned. This application Sept. 20, 1976, Ser. No. 724,897

Int. Cl.[2] F01B *31/00*

U.S. Cl. 92—86.5 **1 Claim**

1. In a fluid piston cylinder assembly comprising a piston reciprocable relative to a piston cylinder and a piston rod attached to the piston, wherein during its operation fluid is introduced on the piston rod side of the piston wherein fluid adheres to the piston rod upon the relative displacement of the piston rod and piston cylinder, the improvement comprising a fluid removing means having at least two piston rod encircling scraper elements and a fluid receiving means including a piston rod encircling recess,

said fluid removing means and said fluid receiving means located on said piston rod said of the piston,

said scraper elements each having a varying inner diameter,

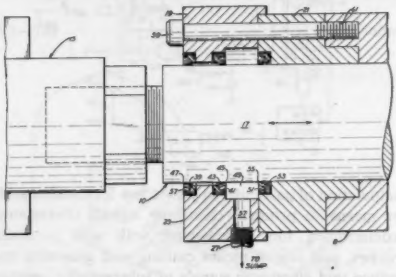
means for locating one of said scraper elements to remove said adhering fluid from said piston rod during relative movement of said piston rod and said piston cylinder in a first direction,

means for locating the other one of said scraper elements to remove said adhering fluid from said piston rod during relative movement of said piston rod and said piston cylinder in a second direction opposite to said first direction and,

the inner diameter of said one scraper element decreases to a minimum inner diameter in said second direction so as to remove said adhering fluid on said piston rod upon said in said first direction relative movement,

the inner diameter of said other scraper element decreases to a minimum inner diameter in said first direction so as to remove said adhering fluid on said piston rod upon said relative movement in said second direction,

means for locating said recess of said receiving means between said minimum inner diameters of said two scraper elements, said recess constructed in a manner to immedi-



ately receive said fluid after removal from said piston rod and having different portions contiguous to said minimum inner diameters and having an outer diameter larger than the outer diameter of said scraper elements,

said recess having an axial dimension which substantially equals the separation between said minimum inner diameters,

gland plate means comprising two separate members, one of which has an annular projection, an opening in said piston cylinder for receiving said projection, said one member including a recess for receiving one of said scraper elements,

the other member having an annular projection for contacting with an annular surface formed on said one member,

said other member also having a recess for receiving said other scraper element, and being formed with said recess of said fluid receiving means, and

means for securing said two members to said piston cylinder.

4,055,108

CRIMPER ASSEMBLY

Herbert K. Holden, Bon Air, and Peter W. Mansfield, Richmond, both of Va., assignors to American Filtrona Corporation, Richmond, Va.

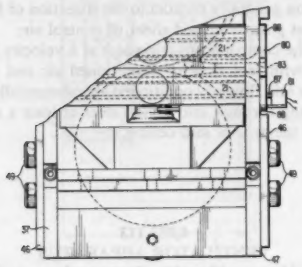
Continuation-in-part of Ser. No. 562,911, March 28, 1975, Pat. No. 4,007,668. This application Sept. 14, 1976, Ser. No. 723,296

Int. Cl.[2] A24C *5/50*

U.S. Cl. 93—1 C **4 Claims**

1. In a crimping assembly for crimping a rod of fibrous material, said assembly having at least one pair of crimping wheels each having embossing means defined on its peripheral surface, means for rotatably supporting each pair of crimping wheels so as to juxtapose their respective embossing means and means for rotating each crimping wheel, the improvement comprising a separate central block extending axially through said crimping assembly from an upstream to a downstream location relative to said crimping wheels, said block having a longitudinally extending bore therein, an anti-stuffing tube inserted in said bore at the downstream location and having its inner end juxtaposed to said crimping wheels, and cut-out

portions on said inner end generally corresponding in configuration to the surface pattern of said crimping wheels, said anti-stuffing tube having a central, longitudinally extending



bore for receiving said rod of fibrous material so as to guide said rod along the bore of said central block and to prevent passage of said rod into the space between the peripheral surface of a crimping wheel and said central block.

4,055,109

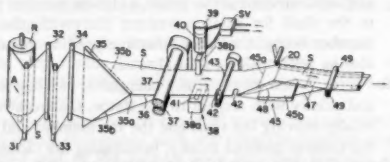
METHOD AND APPARATUS FOR PRODUCING SELF-STANDING BAGS

Osamu Kan, Kyoto, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 601,506, Aug. 4, 1975, Pat. No. 3,980,225. This application May 4, 1976, Ser. No. 683,071

Int. Cl.[2] B31B *31/74*

U.S. Cl. 93—35 R **14 Claims**



1. A method for producing a self-standing bag from a continuous strip of blank sheet, comprising the steps of feeding said continuous strip of blank sheet in the direction of its length, folding said strip along its longitudinal centerline constituting a central folding a central folding line so as to form two opposing halves, punching a series of slots of a specific width in the folded strip transversely thereof along and adjacent the central folding line at a predetermined pitch, forming two secondary folding lines on said strip on opposite sides of said central folding line and in parallel therewith while moving said two halves of said folded strip away from each other, depressing a part of said strip between said two secondary folding lines transversely inward thereby to reverse the folding direction of said central folding line to form said strip into a W-shaped cross section with said slot now located between and covered by said two halves of said folding strip, subjecting said strip to a transverse heat-fusing operation in a region thereof extending transversely and covering each of said slots, with a width broader than that of said slots, and cutting the strip successively along a transverse line bisecting the width of each of said slots.

4,055,110

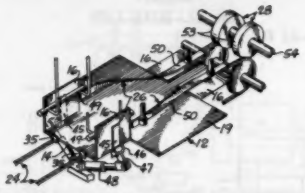
FLAP LAMINATING MECHANISM FOR CARTON BLANKS

Robert H. Graham, Spokane, Wash., assignor to R. A. Pearson Co., Spokane, Wash.

Filed May 26, 1976, Ser. No. 690,159

Int. Cl.[2] F01B *19/00*

U.S. Cl. 93—49 R **8 Claims**



1. A mechanism for laminating pre-cut flaps on planar carton blanks as the carton blanks move to a carton forming station, wherein each carton blank is rectangular in configuration with transverse forward and rearward end edges joining opposed logitudinal side edges, and wherein a laminating flap is located at each corner of the blank, the laminating flaps being transversely foldable about longitudinal laminating fold lines substantially parallel to the side edges of the carton blank, the transverse width of the carton blank area between transversely aligned laminating fold lines being at least twice as great as the transverse width of each laminating flap from its laminating fold line to the side edge of the blank, said mechanism comprising:

a stationary framework;

a longitudinal, upwardly-facing, powered conveyor flight extending along the framework for elevationally supporting individual carton blanks and for continuously moving the carton blanks in succession along a longitudinal path extending the length of the conveyor flight from an infeed end to a discharge end;

carton blank delivery means for directing individual carton blanks onto the conveyor flight adjacent its infeed end, with the longitudinal side edges and laminating fold lines of the carton blanks arranged parallel to the longitudinal path of the conveyor flight with respect to the framework;

a pair of pivot arms mounted to said framework at opposite sides of the conveyor flight, said pivot arms being movable about longitudinal axes parallel to the conveyor path, each pivot arm being movable between a lowered position wherein it is clear of carton blanks moving along the conveyor flight, and a raised position where it engages a laminating flap folded upwardly thereby along its laminating fold line;

stationary folding irons extending downstream along the length of the conveyor flight at each side thereof from locations adjacent the respective pivot arms, said folding irons having inwardly-facing surfaces for engagement by the raised laminating flaps folded by the raised pivot arm adjacent thereto and for folding the raised flaps inwardly over their laminating fold lines and against the adjacent areas of the carton blanks in response to the continuous movement imparted to the carton blank by the conveyor flight;

the distance between each pivot arm and the stationary folding iron associated therewith being less than the laminating flap length measured parallel to the longitudinal path of the conveyor flight, whereby each laminating flap can momentarily overlap both the pivot arm and stationary folding iron adjacent thereto while moving continuously along the longitudinal path of the conveyor flight.

4,055,111

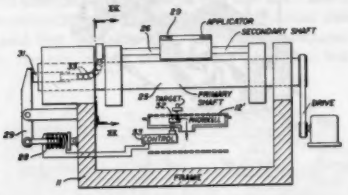
ENVELOPE MACHINE

George F. Howatt, Holden, Mass., assignor to New England Envelope Manufacturing Co., Worcester, Mass.

Division of Ser. No. 543,676, Jan. 24, 1975, Pat. No. 3,982,472, which is a division of Ser. No. 487,906, July 12, 1974, Pat. No. 3,869,965, which is a continuation of Ser. No. 335,725, Feb. 26, 1973, abandoned. This application May 21, 1976, Ser. No. 688,617

Int. Cl.[2] B31B *1/08*

U.S. Cl. 93—61 R **1 Claim**



1. An envelope machine, comprising:

a. an elongated frame,

b. a conveyor mounted in the frame for carrying envelope blanks longitudinally of the frame, the conveyor consisting of a plurality of endless belts mounted side-by-side to define gaps between them and a suction means including a tray underlying the upper run of the belts to provide suction in the gaps, the tray being open upwardly and having vertical side walls whose upper edges extend longitudinally in sealing relationship with the two extreme side belts, and

c. a blank processing element mounted on the frame above the conveyor and spaced upstream a substantial distance from the discharge end of the conveyor.

4,055,112

PROCESS AND APPARATUS FOR VENTILATING OR TEMPERING ROOMS

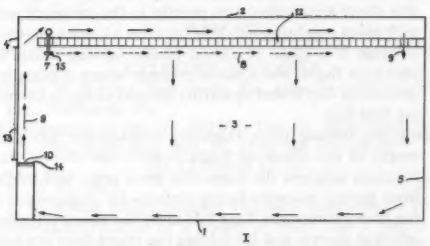
Birger Larkfeldt, Jonkoping, Sweden, assignor to AB Svenska Flaktfabriken, Nacka, Sweden

Filed Dec. 30, 1975, Ser. No. 645,514

Claims priority, application Sweden, Dec. 30, 1974, 7416340

Int. Cl.[2] F24F *13/00, 7/02*

U.S. Cl. 98—33 A **13 Claims**



1. A process for controlling the flow in a room of air controllably conditioned as to its temperature and/or freshness to maintain air in the central portion of said room at or near a predetermined desired temperature and/or freshness, comprising:

launching one or more jets of control air along a plane generally parallel and near to the ceiling of said room but spaced downwardly therefrom, from a launching location positioned near but downwardly of said ceiling, to form a sheet of rapidly-moving control air spaced below and generally parallel to said ceiling over a major portion of the area of said ceiling; and

injecting a flow of said conditioned air into the region of said room above said jets of air and along said ceiling in a direction generally parallel to the direction of flow of the adjacent portion of said sheet of control air;

moving the control air in said sheet at a velocity high compared with said flow of conditioned air and serving to confine said flow of conditioned air substantially to a path extending through said region over at least a major portion of the area of said ceiling.

4,055,113

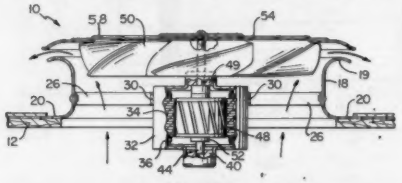
VENTILATOR APPARATUS

Thomas D. Monroe, Memphis, Tenn., assignor to Robbins & Myers, Inc., Springfield, Ohio

Filed May 7, 1976, Ser. No. 684,147

Int. Cl.[2] F24F *7/02, 13/10*

U.S. Cl. 98—43 C **12 Claims**



1. Ventilator apparatus of the type provided with an annular shroud, a fan member encompassed by the shroud, the improvement comprising:

an electric motor coaxial with the fan member, the electric motor including a stator and a rotor, the rotor being rotatably and axially movable within the stator by magnetic forces created within the stator and rotor, a shaft attached to the rotor and rotatably and axially movable therewith, the fan member being attached to the shaft for rotative and axial movement therewith, a closure member attached to the shaft for axial movement therewith, the closure member being in a normal inactive position in substantial closing relationship to the shroud,

the rotor, when magnetically energized, moving rotatively and axially with respect to the stator, thus rotatively and axially moving the shaft and the fan member and moving the closure member axially, positioning the closure member in spaced relationship from the shroud for movement of air between the shroud and the closure member during rotation of the fan member.

4,055,114

APPLIANCE FOR MAKING COFFEE AND THE LIKE

Mindert Kats, and Hendrikus Bernardus Sleumer, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,132

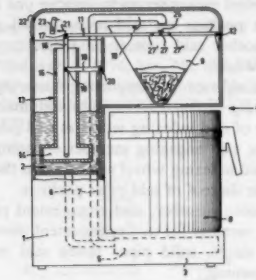
Claims priority, application Netherlands, Apr. 15, 1975, 7504441

Int. Cl.[2] A47J *31/10*

U.S. Cl. 99—280 **5 Claims**

1. An appliance for making coffee and the like, which comprises a housing for a water reservoir and a filtering device including a filter holder, a movable element responsive to the level of the water in the water reservoir, and a lever pivotally supported by the housing and pivotally supporting the filter

holder, one end of the lever being pivotally attached to the movable element, whereby a desired ratio between the amount



of water in the water reservoir and the amount of substance in the filter holder to be filtered can be obtained.

4,055,115

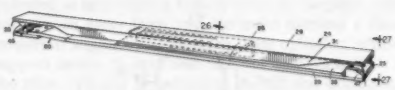
BALE-TIE INTERLOCK DEVICE

Emil Simich, Chicago, and Walter R. Traxinger, Palatine, both of Ill., assignors to A. J. Gerrard & Company, Des Plaines, Ill.

Filed Dec. 14, 1976, Ser. No. 751,348

Int. Cl.[2] B65B *13/06*

U.S. Cl. 100—34 **5 Claims**



1. A bale-tie interlocking device for use with a baling press having a platen for engaging the looped ends of the bale-tie wires about the girth of a bale, comprising:

a housing defining a channel therein and having a plate member extending substantially the length thereof and substantially thereacross to permit release of the engaged and interlocked looped ends of the bale-tie wire from said housing,

shuttle means longitudinally slidable in said housing,

shuttle stop means mounted to said housing at one end thereof to thereby retain said shuttle means within said channel, and

inclined hook plate means mounted in said channel adjacent said shuttle stop means, such that upon the insertion of one looped end of the bale-tie wire into said housing, said shuttle means biases the looped end against said hook plate means to hold the same, such that upon the insertion of the opposite looped end into said housing, the looped ends are engaged, interlocked together and the shuttle is pushed back to release the engaged looped ends.

4,055,116

COUNTING AND PRINTING MECHANISM WITH INTERCHANGEABLE UNIT PRINTER WHEEL

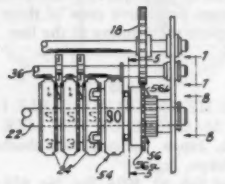
Arnold E. Roberts, and Jack D. Harshman, both of Statesboro, Ga., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Feb. 17, 1976, Ser. No. 658,485

Int. Cl.[2] B41L *45/00*

U.S. Cl. 101—79 **10 Claims**

1. In a counter-printer device, a frame, a printer wheel shaft mounted in said frame, a counting printer wheel rotatably mounted on said shaft and having numerical printing characters on the rim thereof, a drive wheel rotatably mounted on said shaft, and a unit designating printer wheel assembly rotatably mounted on said shaft between said drive wheel and said counting printer wheel, said assembly comprising a unit designating printer wheel having unit designating printing characters on the rim thereof and a central bore therethrough, and a driving hub member mounted for rotation in said wheel bore, said hub having a flange at each end and a central bore therethrough receiving said shaft for rotation thereon, means on the adjacent faces of said hub member and said drive wheel coop-



erating to form a driving connection and means on the adjacent faces of said hub member and said counting printer wheel cooperating to form a driving connection, support means adjacent the rim of said unit designating printer wheel, and releasable locking means for locking said unit designating printer wheel in a selected rotated position to said support means.

4,055,117

PRINTING METHODS AND APPARATUS

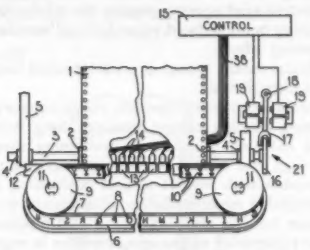
Basil Sidney Munday, Harpenden, England, assignor to International Computers Limited, London, England

Filed June 17, 1976, Ser. No. 697,244

Claims priority, application United Kingdom, July 2, 1975, 27876/75

Int. Cl.[2] B41J *1/20*

U.S. Cl. 101—93.14 **5 Claims**



1. Apparatus for printing on a record a line of characters from one of a plurality of interchangeable fonts of type, each font consisting of characters of the same size, different fonts having characters of different sizes respectively, the required pitch spacing of characters in a line being dependent upon the particular font from which the characters are selected, the apparatus including means for supporting the record; a plurality of print hammers arranged adjacent the record in a line parallel to the line in which the characters are required to be printed and being spaced apart at constant pitch, driving means engageable with a type carrier having a member carrying the characters of a single font to drive that member to move the characters in sequence past each of the hammers during a printing cycle; selectively operable shifting means for producing a lateral displacement between the record and the hammers in the direction of the printing line; switch means settable in accordance with the size of the characters of the engaged type carrier and control means effective to select the hammers to be operated at those time instants when characters are respectively in their required positions in the line during the cycle, the control means being further arranged in response to the setting of the switch means to operate the hammers to print all

the characters of a line in a single cycle if the characters are of a first size requiring the spacing of the characters in the line to correspond to the pitch spacing of the hammers, to operate the hammers to print the line of characters in at least two cycles if the characters are of a second size requiring the spacing of characters in the line to be less than the pitch spacing of the hammers and to operate the shifting means to produce a lateral displacement equal to the required pitch spacing of characters in the line between successive ones of those printing cycles required to complete the printing of the line.

4,055,118

PRINTING HEAD FOR PORTABLE LABELING MACHINE, OR THE LIKE

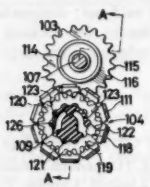
Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Feb. 17, 1976, Ser. No. 658,491

Claims priority, application Japan, Feb. 17, 1975, 50-020758[U]

Int. Cl.[2] B41J *1/20*

U.S. Cl. 101—110 **9 Claims**



1. A printing head for selecting and imprinting selected indicia, comprising:

at least one rotatable indexing wheel; said indexing wheel having an external periphery; said indexing wheel having a central axial opening passing therethrough; said central opening being defined by an internal annular wall of said indexing wheel;

first detent means spaced at predetermined intervals around said internal wall;

an internal positioning member; means supporting said positioning member against rotation along with rotation of said indexing wheel; said positioning member passing through said central opening; said indexing wheel being rotatable with respect to said positioning member; said positioning member further comprising two engagement pieces for said indexing wheel; said positioning member also comprising an engaging member in engagement with said internal wall and to which said engagement pieces are integrally attached; said engagement pieces extending in opposite directions from their said engaging member around said internal wall; said engagement pieces being held in fixed position on said positioning member engaging member and being held in engagement with said indexing wheel internal wall; each said engagement piece comprising a resilient arm bent into shape and positioned to engage the respective said internal wall along the length of said engagement piece arm;

at least one second detent means attached to each said engagement piece and engageable with each said first detent means as said indexing wheel and its said first detent means are rotated past said second detent means; said second detent means being so spaced apart and placed on their respective said engagement piece that both said second detent means alway simultaneously engage a respective said first detent means;

a plurality of printing types; means for holding said printing types to the exterior of said indexing wheel; said indexing wheel having a print position thereon at which a said type is in position to imprint; the length of each said type around said indexing wheel being related to the interval between two said first detent means such that rotation of said indexing wheel from engagement between one said first detent means and said second detent means to engagement between another said first detent means and said second detent means serves to remove one said type from said print position on said index wheel periphery and moves another said type to said print position on said indexing wheel;

said positioning member supporting a bearing portion having a bearing surface that engages said internal wall at the same side of said indexing wheel as said print position for said types; said engaging member engaging said internal wall of said indexing wheel at a location thereon opposed to the side thereof of said print position;

said positioning member, said engagement pieces and said engaging member for said engagement pieces all being an integral, single, solid piece inside said indexing wheel central opening;

rotating means for causing rotation of said indexing wheel.

4,055,119

MEANS FOR MOUNTING AND BIASING A SQUEEGEE

Mathias Mitter, Verl-Sende-Mitte, Germany, assignor to Mitter & Co., Schloss Holte, Germany

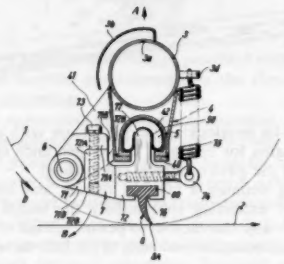
Filed June 19, 1974, Ser. No. 479,948

Claims priority, application Germany, June 20, 1973, 2331428

The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.

Int. Cl.[2] B41F *15/46*

U.S. Cl. 101—120 **2 Claims**



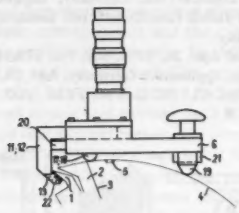
1. In a screen printing machine, a combination comprising an elongated liquid-permeable stencil having endless internal and external surfaces; means for moving said stencil so as to engage successive increments of a web of material to be treated along a region of contact which extends lengthwise of said stencil; a movable holder having one side facing towards said region of contact and another side which faces away from said region of contact and is provided with a bar-shaped extension extending lengthwise of said stencil, stationary support means for supporting said holder and having a portion located in the interior of said stencil; a squeegee mounted on said holder at said one side thereof, said holder comprising a first portion which is pivoted to said support means; a second portion which supports said squeegee, and fastener means separably securing said second portion to said first portion, and said holder being movable by pivoting about an axis which is substantially parallel to the longitudinal extension of said stencil and is located ahead of said squeegee, as considered in the direction of movement of said stencil; and biasing means interposed between said support means and said holder to urge said squeegee against said internal surface, including an elongated tubular gas-filled cushion which straddles said bar-shaped extension and is inwardly deformed by the same so that variations in the depths of the deformation of said cushion result in corresponding variations in the biasing action.

4,055,120

APPARATUS FOR ADJUSTING A TENSIONING DEVICE IN PLATE CYLINDERS OF ROTARY PRINTING MACHINES

Wolfgang Kamm, Stettlen, Switzerland, assignor to Maschinenfabrik Wifag, Bern, Switzerland

Filed Apr. 7, 1976, Ser. No. 674,587
Claims priority, application Sweden, Apr. 14, 1975, 7504270
Int. Cl.[2] B41B *1/00*; B41F *27/00*
U.S. Cl. 101—378 8 Claims



1. Apparatus for adjusting a tensioning rail of a tensioning device in a printing plate support cylinder of a rotary printing machine, comprising:

a support base member;

at least one abutment member engageable with the tensioning rail; said abutment member being supported by said base member and being adjustable in position with respect to said base member;

an optical control device supported on said base member, oriented so as to view a field of view on the plate cylinder and spaced away from said abutment member a distance measured angularly around the plate cylinder; adjustable support means on said base member and engageable with the plate cylinder for adjusting the tilt and orientation of said base member on and with respect to the plate cylinder, thereby to orient said optical control device to have its field of view radially aligned with the plate cylinder;

said base member having a bottom, a top and sides; said abutment member projecting from a said side of said base member and is movable with respect to that said side; said optical control device being above said top of said base member; said support means extending beneath said bottom of said base member.

4,055,121

DEPTH CONTROLLED NAVAL MINE

Robert E. Jasperson, Annapolis, Md.; Charles G. Erb, Falls Church, Va.; Donald F. Haber, Cape St. Clair, and Andrew A. Pouring, Edgewater, both of Md., assignors to Trident Engineering Assoc., Inc., Annapolis, Md.

Filed Sept. 10, 1968, Ser. No. 758,766
Int. Cl.[2] F42B *22/18*
U.S. Cl. 102—14 4 Claims

1. A tethered automatic naval mine comprising

A. a buoyant casing formed with a parabolic profile and having an explosive charge therein, and

B. a removable container insertable in said casing, said container including:

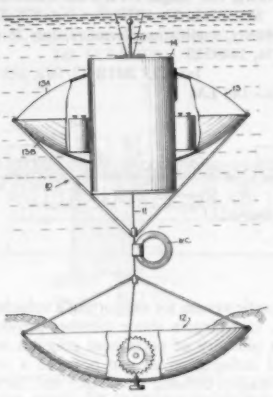
a. a detonator for said charge,

b. a switch coupled to said detonator to set off said charge when the switch is closed,

c. a wand operatively coupled to said switch and extending outside of said container, said wand normally occupying a vertical position and being caused to assume an angular position to actuate said switch when contacted by a passing craft,

d. a pressure-sensitive transducer responsive to water pressure to provide a signal representative of the depth of said mine below the surface of the water, and

e. means responsive to said signal to vary the depth of said mine to maintain said mine at a predetermined depth regardless of changes in the level of the water, said means including an extendible cable linking said mine to



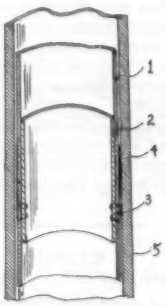
an anchor, the length of said cable being varied in response to said signal.

4,055,122

METHOD OF PLACING BLASTING CHARGES IN WET BOREHOLES

Barney P. Muldrow, Jr., Ocala, Fla., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Apr. 15, 1976, Ser. No. 677,185
Int. Cl.[2] F42D *1/00*
U.S. Cl. 102—23 1 Claim



1. The method of placing an aqueous gel explosive charge in a water-filled borehole in a poorly consolidated rock formation comprising the steps:

a. placing sections of cardboard tubing end-to-end inside a removable casing which is standing in a borehole containing water, while reinforcing and connecting the ends of the sections of cardboard tubing together by placing a close-fitting tubular bushing of sufficient compressive strength inside and extending for a substantial distance inside the ends of adjacent sections of tubing;

b. removing the removable casing which surrounds the cardboard tubing, and

c. filling the inside of the connected sections of cardboard tubing with an aqueous gel explosive composition.

4,055,123

SYSTEMS FOR MAGNETICALLY SUPPORTING A VEHICLE

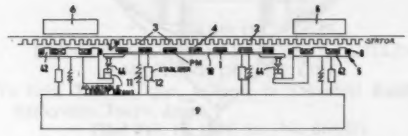
Gotz Heidelberg, Am Hugel 16, D-8136 Percha, Germany

Filed July 23, 1975, Ser. No. 598,271

Claims priority, application Germany, July 26, 1974, 2436106; Oct. 17, 1974, 2449528

Int. Cl.[2] B61B *13/08*

U.S. Cl. 104—148 LM **13 Claims**



1. A magnetic system for supporting a vehicle moving along a roadway, including: a stator member provided along said roadway; a plurality of permanent magnets located on said vehicle and defining an air-gap between a surface of each permanent magnet defining a pole face and the stator member; means located on said vehicle for maintaining the air-gap between said pole faces of the permanent magnets and the stator member; means defining a magnetic lateral guide system between said vehicle and said roadway, said magnetic guide system being weakened in predetermined regions along said roadway; and means defining a mechanical lateral guide system composed of mechanical lateral guide elements secured to said vehicle, and guide blocks located on said stator member in those regions where said magnetic guide system is weakened and arranged to cooperate with said guide elements.

4,055,124

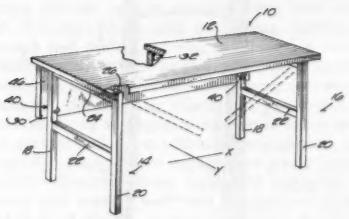
FOLDING TRAINING TABLE

James A. Weagle, Tupelo, Miss., assignor to Krueger Metal Products, Inc., Green Bay, Wis.

Filed Nov. 11, 1976, Ser. No. 740,907

Int. Cl.[2] A47B *3/00*

U.S. Cl. 108—132 **3 Claims**



1. A table having a top with a longitudinal X axis and a transverse Y axis said table having ends and sides, leg assemblies hingedly connected to said top adjacent the ends thereof for pivotal movement about a Y axis between folded and unfolded positions, a side panel hingedly connected to a side edge of said table for movement about the X axis between a folded and unfolded position, and means for connecting said panel to said leg assemblies to maintain the leg assemblies and panel in the unfolded erect position, said means including an opening in each leg assembly open along the Y axis and facing laterally outwardly of the top along the Y axis, projections on said panel registrable with said leg openings when the panel and leg assemblies are in the unfolded position, said projections preventing movement of said leg assemblies about said hinged connection to the top, said means further including hooks shiftable along the X axis between a leg clearance position and a leg embracing position with said hooks preventing movement of said panel to the unfolded position and disengagement of the projections when said hooks are in the leg embracing position, and wherein said hooks are supported in apertures in said projections and said hooks are rotatable about an axis parallel to the X axis to afford folding of the hook against the panel.

4,055,125

INCINERATOR, ESPECIALLY FOR BURNING WASTE MATERIAL

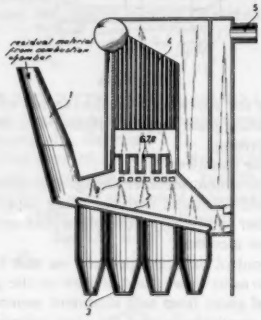
Heinz Mallek, Linnich-Tetz, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Apr. 26, 1976, Ser. No. 679,912

Claims priority, application Germany, Apr. 24, 1975, 2518128

Int. Cl.[2] F23G *5/00*; F23J *3/00*

U.S. Cl. 110—8 R **4 Claims**



1. An incinerator plant with a flue, especially for burning waste materials, which comprises combustion means including a combustion chamber for receiving and burning waste materials, conduit means associated with said combustion chamber for conveying fresh air therethrough, and purifying means for purifying flue gases derived from the combustion of waste materials, said purifying means including filter means of high heat resistant material in said combustion chamber so that deposited particles themselves form a solid filter layer and interposed directly between said combustion chamber and said flue.

4,055,126

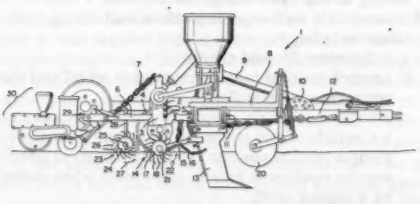
SUB-SOIL BREAKING, SURFACE-SOIL CONDITIONING AND PLANTER MACHINE

Ronald P. Brown, 203 Meadowlake Drive, Ozark, Ala. 36360, and Jerrell W. Harden, Rte. 1, Banks, Ala. 36005

Division of Ser. No. 578,356, May 16, 1975. This application Jan. 8, 1976, Ser. No. 647,465

Int. Cl.[2] A01C *5/00*; A01B *21/02*

U.S. Cl. 111—85 **12 Claims**



1. A sub-soil breaking and surface-soil modifying and planting combination, comprising first support means for supporting functional elements; a rotary cutting blade means for rotating along and cutting a slot in upper earth soil, to a first predeter-

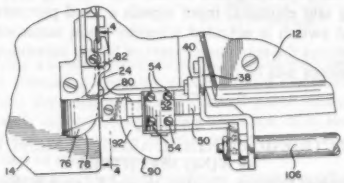
mined depth, and mounted on the first support means; a sub-soil blade cutting means for cutting through and extending down and below said upper earth soil in sub-soil earth a second predetermined depth, and mounted on said first first support means in trailing cutting relationship to the rotary cutting blade means and aligned therewith for following within said slot, such that a sub-soil groove is formed; a sub-soil earth-filler means for collapsing side walls defining said slot and said groove to effect a substantially filling-in of soil into said groove; a rotary tine-wheel means for preparing a seed bed and mounted on said first support means and aligned with each of the sub-soil blade cutting means and the sub-soil earth-filler means in trailing relationship thereto for following filled-in-earth prepared by said sub soil earth filler means; and a planter means for planting into prepared seed bed prepared by said rotary tine-wheel means; said sub-soil earth-filler means being mounted on said first support means; said planter means being mounted on the first support means such that the planter means follows in a trailing relationship to the rotary tine-wheel means; said sub-soil earth-filler means including a rotatable wheel-like element having blunted tines extending radially outwardly from a hub, some of the blunted tines extending laterally in one direction and others extending laterally in an opposite direction, the lateral directions being lateral relative to a plane of rotation of the rotatable wheel-like element, and a predetermined dimension between terminal ends of the tines extending in said one direction and tines extending in said opposite direction being substantially larger than the predetermined with of said groove such that the terminal ends are adapted to collapse said side walls of the groove, and when the rotating wheel-like element is rotated along the sub-soil slot.

4,055,127

HEM FOLDING ATTACHMENT

James E. Sharp, Economy, Ind., assignor to Union Special Corporation, Chicago, Ill.

Filed Mar. 12, 1976, Ser. No. 666,386
Int. Cl.[2] D05B *35/04*
U.S. Cl. 112—143 **10 Claims**



1. An apparatus for folding the edge of a flexible sheet prior to the stitching of the folded edge by a stitch forming mechanism, said apparatus comprising:

first movable guide means having a folding portion means;

second movable guide means; a stitch forming mechanism;

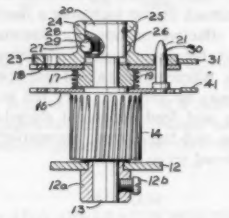
actuation means connected to said guide means for effecting movement of said guide means wherein said second guide means cooperably associates with said first guide means to effect folding of an edge portion of said sheet to form an S-shaped fold in said edge; and finger portion means associated with said first movable guide means, being interposed within said fold and having a rearwardly extending guiding edge which is generally parallel to the line of feed in front of said stitch forming mechanism for urging said sheet against said stitch forming mechanism.

4,055,128

ORNAMENTAL STITCH SEWING MACHINE

Teiichi Nishigami, Osaka, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Moriguchi, Japan

Filed Feb. 23, 1976, Ser. No. 660,367
Claims priority, application Japan, Feb. 27, 1975, 50-27272
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 A **4 Claims**



1. In an ornamental stitch sewing machine comprising a frame, a feed dog, means for imparting movement to the feed dog, control means for varying the amplitude and the direction of the feed movements of the feed dog during sewing, means including a first cam and first cam tracking element for mechanically and automatically imparting movement to the control means to vary the amplitude and direction of the feed movement of the feed dog during sewing, a needle bar mounted for endwise reciprocation and for sidewise movement transversely of the direction of reciprocation, a second cam, a second cam tracking element, means biasing the first and second cam tracking elements against respective cams whereby the tracking elements will track and respond to said respective cams, transmission mechanism connecting the second cam tracking element with the needle bar for shifting the needle bar sidewise in conformance with the cam response of the second tracking element, means for rotating said cams in synchronism with the needle bar reciprocating movements, said first and second cams being coaxially mounted in spaced relation on a drive shaft for rotation therewith with said second cam being axially slidable, spring means normally biasing said second cam axially of said shaft into operative registration with said second tracking element, a third cam arranged to be received on said shaft in superposed relation to said second cam so as to displace said second cam from registration with said second tracking element, and means for releasably securing said third cam on said shaft in operative registration with said second tracking element whereby said second tracking element will respond only to said third cam with said second cam being rendered ineffective.

4,055,129

DIGITAL DIFFERENTIAL CAPACITANCE PROXIMITY SWITCH

Barney D. Hunts, Mountain Lakes, N.J.; George H. Hare, San Mateo, Calif., and Bradley Eaton, Pompton Plains, N.J., assignors to The Singer Company, New York, N.Y.

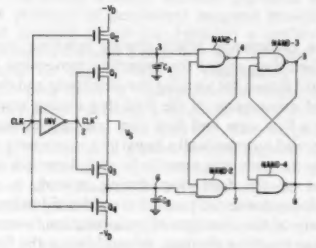
Continuation-in-part of Ser. No. 596,685, July 16, 1975, abandoned. This application Dec. 3, 1975, Ser. No. 637,449
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 E **8 Claims**

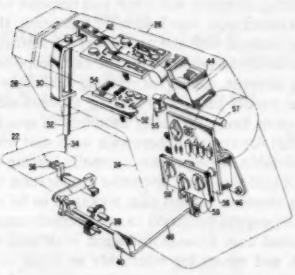
1. In a sewing machine having stitch-forming instrumentalities positionally controlled over a predetermined range between stitches to produce a pattern of feed and bight controlled stitches; logic means for storing pattern stitch information in digital form; means operating in timed relation with the sewing machine for recovering selected digital pattern stitch information from said logic means; feed and bight digital-to-analog converter means for generating positional feed and bight analog signals, respectively, related to said selected digital pattern stitch information; and feed and bight closed loop

servo means including reversible electric motors responsive to said feed and bight analog signals, respectively, for positioning said stitch-forming instrumentalities to produce a pattern of stitches corresponding to the selected digital pattern stitch information,

signal control operational amplifier means interposed between said feed and bight digital-to-analog converter means and said feed and bight closed loop servo means, respectively, each of said operational amplifier means having a feedback circuit including a rheostat,

switch means effective on operator command to insert a wiper on said rheostat in bypass arrangement in said feedback circuits, whereby the gain of said operational amplifier means may be varied to vary the analog signal received from said feed and bight digital-to-analog converter means and transferred, respectively, to said feed and bight closed servo means;





wherein the improvement comprises: a differential capacitance proximity switch, said proximity switch having a bias capacitance, a sensing capacitance including a knob operatively connected to said wiper, said sensing capacitance being smaller than said bias capacitance when not augumented by proximity relationship, means for charging and discharging said capacitances, means for detecting the discharge rates of said bias and sensing capacitances, said detecting means having a first response when said sensing capacitance has a faster discharge rate than said bias capacitance, said detecting means having a second response when said sensing capacitance has a slower discharge rate than said bias capacitance; and,

means for rendering said switch means effective when said detecting means generates said second response.

4,055,130

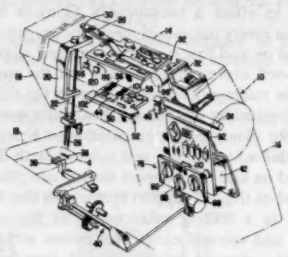
BIGHT STOP MECHANISM FOR SEWING MACHINES

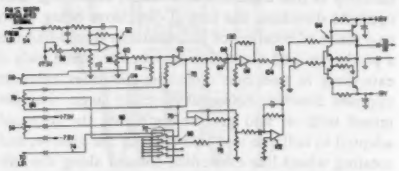
Robert H. Larsen, Middletown, and Philip F. Minalga, Piscataway, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,641

Int. Cl.[2] D05B *3/02, 1/08*

U.S. Cl. 112—158 R **7 Claims**





1. In a sewing machine having endwise reciprocable needle means, jogging means for initiating relative lateral movement of said needle means, electric motor means connected to said jogging means such that initiation of the relative lateral movement of said needle means is controlled in accordance with movement of said electric motor means, means including first circuit means for generating electrical input signals in accordance with predetermined stitches in a selected pattern and for connecting said electrical input signals to said electric motor means, said electric motor means having a work output proportional to said electric input signals, and circuit means in addition to said first circuit means and including switch means for limiting the magnitude of the electrical input signals to said electric motor means, said circuit means being operative for reducing said electrical input signals a fixed percentage each time said switch is actuated whereby upon actuation of said switch means the maximum extent of lateral movement of said needle means will be limited.

4,055,131

ELECTRONIC CONTROL ARRANGEMENT FOR SEWING MACHINES

James Eugene O'Brien, Kenilworth, and Edward Walter Ostapczuk, Union, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Mar. 26, 1976, Ser. No. 670,777

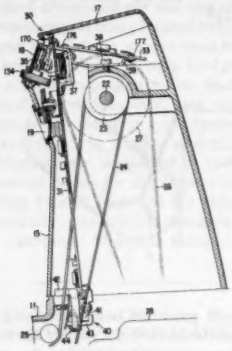
Int. Cl.[2] D05B *3/02*

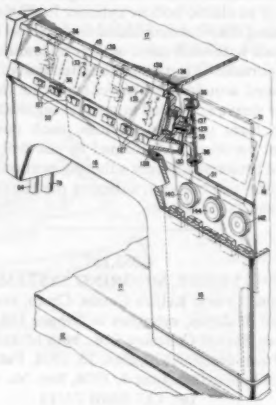
U.S. Cl. 112—158 E **3 Claims**

1. In a sewing machine having a frame with at least two access openings therein, functional mechanical, electromechanical and electrical components supported within said frame, said functional components including a work feeding system, a needle carrying needle bar, a needle bar gate supporting said needle bar for lateral oscillation and endwise reciprocation, drive means, means connected with said drive means for endwise reciprocating said needle carrying needle bar and for actuating said work feeding system, sewing instrumentalities cooperating with said needle in the formation of stitches, and means for selectively oscillating said needle bar gate and regulating said work feeding system in the formation of deco-

rative and functional stitch patterns; wherein the improvement comprises:

a. a unitary electronic control module removably insertable through an access opening, said module having means attachable to said frame in a position accessible from at least one of said access openings, said module having electronic means thereon for regulating said functional electromechanical and electrical components, said module





having a control panel means associated with said module and providing operator access to said electronic means, means for supporting said control panel means on said module in a position to close a portion of at least one of said access openings when said attachable means is attached to said frame; and

b. means connecting said electronic control module to said functional electromechanical and electrical components.

4,055,132

METHOD OF FORMING PORTS IN A FUEL BURNER

Charles E. Stohrer, Jr., Hickory Hills; Norman M. Huff, Chicago, both of Ill., and Leonard J. Micinski, Mishawaka, Ind., assignors to Harper-Wyman Company, Hinsdale, Ill.

Filed Mar. 18, 1976, Ser. No. 668,294

Int. Cl.[2] B21D *28/10*

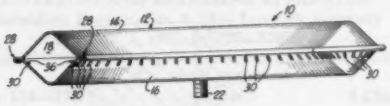
U.S. Cl. 113—116 EE **4 Claims**

1. A method of porting a fuel burner having a body of a complex shape wherein ports are to be formed in an array including more than a straight line, said method comprising the steps of:

providing on a tool structure a plurality of punch members in an array corresponding to the burner port array;

supporting the burner body and said tool structure for relative movement toward and away from one another with said punch members facing toward said burner body;

moving said tool structure and said burner body toward one another in order to form the entire array of ports in said



burner body in a single relative movement of said tool structure relative to said burner body; and

halting said relative movement at a desired depth leaving sheared slugs attached to the burner body and said slugs lying in parallel planes to direct fuel out of said ports.

4,055,133

METHOD AND APPARATUS FOR TRIPLE ROLL SEAMING END CLOSURES TO CONTAINER BODIES

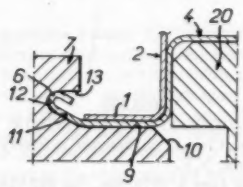
Eugene Wessely, Colombes, France, assignor to Gallay S.A., Paris, France

Filed July 26, 1976, Ser. No. 708,922

Claims priority, application France, July 31, 1975, 75.23885

Int. Cl.[2] B21D *51/32*

U.S. Cl. 113—120 Y **25 Claims**



1. A method for triple roll seaming flanged sheet material end closures to a flanged sheet material container body in which the end closure is received in an open end of the container body and the end closure flange is deformed alone before rolling the two flanges together; wherein the improved deformation step comprises raising a frustoconical portion at a predetermined angle in the peripheral portion of the flanged end closure and forming an initial, small radiused rolled section at the free end of said flanged end closure so that upon the completion of said improved deformation step the small radiused rolled section is disposed at the outer end of the completed frustoconical portion; and then rolling said flanges radially inwardly together around each other until a triple rolled seam is obtained including more than five layers of container body and end closure sheet material.

4,055,134

EDGE PROTECTION FOR EASY OPENING END CLOSURE

Obert M. Ostrem, Westmont; Donald F. Kulikowski, Oak Forest, and Sam C. Pulciani, Norridge, all of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Division of Ser. No. 657,418, Feb. 12, 1976, abandoned, which is a continuation-in-part of Ser. No. 641,472, Dec. 17, 1975, abandoned. This application Aug. 5, 1976, Ser. No. 712,409

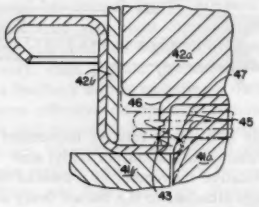
Int. Cl.[2] B21D *51/44*

U.S. Cl. 113—121 C **8 Claims**

1. A method of producing an end closure for a can or similar container comprising the steps of: providing a shell having a generally flat end panel; forming in said end panel at least two axially offset sections joined by a connecting portion;

forming a score line in said connecting portion; upsetting

said connecting portion so that at least a part thereof assumes a substantially perpendicular position relative to said two sections and part of it forms an extension of one of said sections, and then collapsing the remaining part of



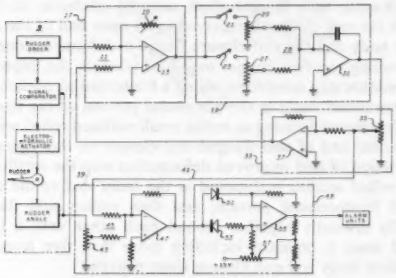
said connecting portion between said sections, said score being shifted radially inwardly during said upsetting of said connecting portion to effect a stress on the score residual primarily in compression.

4,055,135

RUDDER ERROR DETECTOR

Charles R. Wesner, Crozet, Va., assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 4, 1976, Ser. No. 692,814
Int. Cl.² B63H *25/36*
U.S. Cl. 114—144 E **4 Claims**



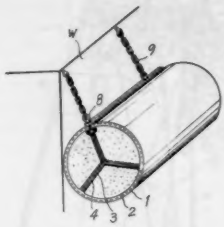
1. Apparatus for detecting a malfunction in a ship's hydraulic steering system employing a plurality of pumps, said apparatus including means to provide rudder order and actual rudder angle signals indicative of the instantaneous position of the helm and rudder, respectively, simulator means for providing a simulated rudder angle signal indicative of the expected response of the rudder to an order signal, said simulator means including an adjustable integrating means for providing a time delay approximating that experienced in the mechanical components of the ship's steering system and a separate potentiometer corresponding to each of the pumps for matching the integrator to each pump individually, means for comparing the simulated and and actual rudder angle signals, and means for actuating an alarm whenever the difference between the instantaneous values of the simulated and actual rudder signals exceeds a given threshold.

4,055,136

MULTI-CELL GAS-FILLED BAG AND METHOD FOR PRODUCING THE SAME

Masao Fujisawa, Chigasaki; Mitsugu Makise, and Mamoru Kadono, both of Yokohama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 31, 1976, Ser. No. 672,358
Claims priority, application Japan, Apr. 2, 1975, 50-39268
Int. Cl.² B63B *59/02*
U.S. Cl. 114—219 **5 Claims**



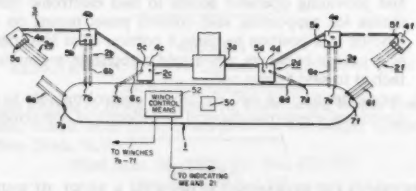
1. A multi-cell gas-filled bag comprising: an outer sleeve composed of an elastic rubber cylinder having a tension-resistant reinforcing material embedded therein, an inner concentric sleeve of substantially the same length as said outer sleeve composed of an elastic hollow cylinder having a tension-resistant reinforcing material embedded therein, said inner and outer sleeves united with each other at their ends and at a plurality of adhering portions extending longitudinally of and being equally spaced around said sleeves such that the inner surface of the outer sleeve is divided into equal segment regions, and is adapted to form gas-filled cavities, each cavity having an independent partition wall formed by the deformation of the inner sleeve between adjacent adhering portions in the longitudinal direction and between adhering portions at both ends of said inner and outer sleeves.

4,055,137

VESSEL MOORING SYSTEM

Yoichi Motai, Urawa; Keijiro Gouda, Chofu, and Atsuya Isono, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd. and Mirua Shokai Company Ltd., both of Tokyo, Japan

Division of Ser. No. 535,570, Dec. 23, 1974, Pat. No. 3,970,028.
This application June 4, 1976, Ser. No. 692,765
Int. Cl.² B63B *21/16*
U.S. Cl. 114—230 **1 Claim**



1. A system for mooring a vessel to a facility on a wharf or pier, said system comprising a plurality of mooring means, tensional force detecting means incorporated in each said mooring means, said tensional force detecting means including means for generating a tension signal and means for adjusting the tensional force exerted on said respective mooring means in accordance with the signals generated by said detecting means whereby the vessel is moored to the facility in a well balanced condition, each said mooring means comprising a plurality of fixing means rigidly secured to the mooring facility, at least one hook formed on each said fixing means, each said hook comprising a base portion defined by a pair of spaced apart side

plates that straddle said hook and which are coupled to each other by means of a transverse pin, a plurality of ropes each having one end connected to said hook, and a winch which is provided on board said vessel and to which the other end of said ropes are connected, each said detecting means comprising strain gauge means mounted on each said plate, each said strain gauge means comprising two pair of strain gauges with each said pair of gauges being defined by an active gauge and a dummy gauge, one of each said pair of active and dummy gauges being located above said pin and one of each said pair of active and dummy gauges being located below said pin, said active strain gauges and dummy gauges each being connected by conductors, thereby defining a single load cell, there being further included a visual indicating means located in the central portion of said mooring facility, said visual, indicating means being connected by means of a conductor to the respective tensional force detecting means, whereby the tensional force on the respective ropes is signaled by said visual indicating means and control means for the respective winches, said control means being located on board the vessel, said control means being electrically connected to said indicating means to thereby present automated tensional force control for said ropes.

4,055,138

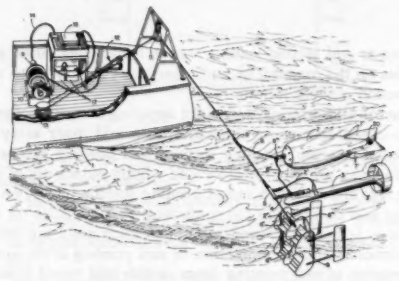
UNDERWATER VEHICLE TOWING AND RECOVERY APPARATUS

Martin Klein, Amesbury, Mass., assignor to Klein Associates, Inc., Salem, N.H.

Continuation of Ser. No. 547,998, Feb. 7, 1975, abandoned, which is a continuation of Ser. No. 335,681, Feb. 26, 1973, abandoned. This application June 21, 1976, Ser. No. 698,300

Int. Cl.² B63G *8/42*

U.S. Cl. 114—244 **8 Claims**



1. Underwater vehicle towing and recovery apparatus having, in combination, tow cable means, vehicle means having coupling means connected to the tow cable means; water foil depressor means connected with the vehicle means for creating downward forces as the vehicle means is towed underwater by the tow cable means; elongated streamlined buoyant recovery means, stabilized at a free end by a fin structure, and disposed above said vehicle means, said recovery means being flexibly connected at a leading end only thereof to a leading end of said vehicle means and to said cable means to be towed horizontally submerged substantially parallel to and above the vehicle means and being provided near its other and free end with the normally ineffective signalling means, the recovery means being permanently buoyantly adjusted so as to rise free-end upward to the surface when the vehicle means is no longer being towed, as upon at least one of stoppage of towing and severance of the tow cable means, to carry at least the vehicle means to the vicinity of the surface, and to float in a vertical attitude with its free end exposed above the surface, said recovery means and said vehicle means being free to move downwardly in response to the downward forces of said depressor means and being devoid of restraint from the water surface other than by said tow cable means; and the recovery means being further provided with means for rendering the normally ineffective signalling means effective when the said free end surfaces in upward position.

4,055,139

CONVEYING AND RETAINING APPARATUS

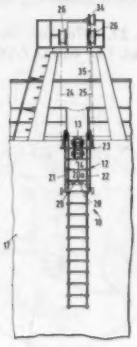
Horst Scheiding, Duringer Str. 4, 2854 Loxstedt, Germany

Filed Nov. 3, 1975, Ser. No. 628,677

Claims priority, application Germany, Nov. 14, 1974, 2454099

Int. Cl.² B63B *35/00*

U.S. Cl. 114—270 **8 Claims**



1. In an apparatus suitable for transporting and retaining payloads on ferrous metal surfaces using electromagnetic holding devices, more particularly a pilot lift on the outboard walls of ships having at least one electromagnet disposed at a reduced distance from a surface to be moved over by running gear on a bearing frame adapted to receive the payloads, the improvement comprising an electricity generating unit for providing power to the electromagnet being mounted on said bearing frame, said generating unit comprising a D.C. generator drivable by a compressed-air motor, said generator capable of producing electric power for the electromagnet, and being disposed on the bearing frame.

4,055,140

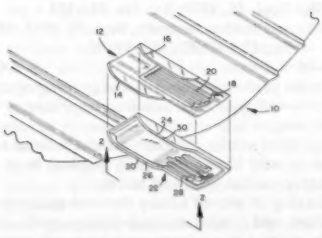
JET DRIVE BOAT COVER

James J. Kirchhan, 1192 Paularino Ave., Costa Mesa, Calif. 92626

Filed Jan. 15, 1976, Ser. No. 649,472

Int. Cl.² B63H *5/16*

U.S. Cl. 115—76 **10 Claims**



1. A cover for an opening of a jet drive boat propulsion system for mounting on a boat hull wherein the opening is formed within a fixture implaced in the bottom of the boat hull and has a grating thereover said cover comprising:

a housing for substantially conforming to the fixture in a manner whereby it covers the opening; and

an overcenter latching device connected to said housing and having an engagement hook for latching to the grating

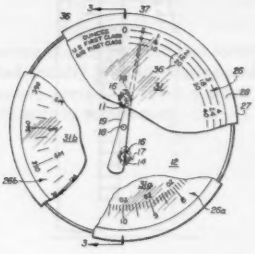
wherein said hook is operable from the outside of the housing by an eccentric linkage means which moves said engagement hook eccentrically from an unsecured into a secured relationship with a portion of the grating.

4,055,141

TRANSPARENT DIAL AND OUTER TRANSPARENT COVER FOR SCALE WITH ZERO-SETTING ADJUSTMENT

Douglas M. Homs, 1538 Industrial Way, Hillsborough, Calif. 94002

Filed Feb. 27, 1976, Ser. No. 662,147
Int. Cl.[2] G01D *7/00*
U.S. Cl. 116—129 F **7 Claims**



1. A scale dial-cover combination comprising a transparent circular cover having a flat circular face and cylindrical peripheral first flange, a scale pan having a cylindrical peripheral second flange shaped to engage said first flange, said circular face marked with scale dial markings, said flanges fitting over each other with a slip fit to permit rotation of said cover about the central axis of said pan and to permit said cover to be slipped off said second flange for replacement with a different face, a scale frame bracket, said pan being apertured, attachment means for securing said pan to said bracket, a pointer staff extending through said pan, and a pointer on said staff a short distance behind said face, said pan being formed with enlarged holes and said bracket with tapped holes, screws fitting with play through said enlarged holes and into said tapped holes, to adjust and fix the position of said pan relative to said bracket with said second flange centered relative to said staff.

4,055,142

METHOD AND APPARATUS FOR PERFORMING A PLURALITY OF SEQUENTIAL OPERATIONS UPON EACH OF A SERIES OF ARTICLES

Dusan Sava Lajovic, 73 Victoria St., Smithfield, New South Wales, Australia (2164)

Filed Sept. 15, 1975, Ser. No. 613,352
Claims priority, application Australia, Sept. 25, 1975, 9015/75
Int. Cl.[2] B05C *1/02, 13/02*
U.S. Cl. 118—46 **5 Claims**

1. Apparatus for performing coating and printing operations on each of a series of cylindrical articles comprising:

a rotatable turret;

a plurality of first axially directed mandrels fixed to said turret and equally circumferentially pitched in an outer circular array coaxial with said turret;

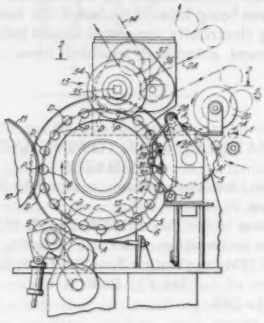
a similar plurality of second axially directed mandrels fixed to said turret, said second mandrels being equally circumferentially pitched in an inner circular array concentric with said outer array and having a diameter smaller than that of said outer array, said mandrels in said inner and outer arrays being staggered so that mandrels in one of said arrays are substantially equidistant from adjacent mandrels in the other of said arrays;

means for indexing said turret to bring each of said first mandrels successively into a first loading station, a coating station and a first unloading station while also bringing each of said second mandrels successively into a second loading station, a printing station and a second unloading station, said stations being spaced around said turret at angular positions separated by an integral multiple of said pitch;

means at said first loading station for loading a cylindrical article on the mandrel in said outer array indexed into said first loading station;

means at the coating station for applying a coating to the external surface of the article on the mandrel in said outer array indexed into said coating station, said coating means including a coating roller located outside of said arrays and arranged to contact articles on said outer array while avoiding contact with articles on said inner array so that only articles on said outer array are coated;

means at said first unloading station for removing coated articles from the mandrel in said outer array indexed into said first unloading station for curing of said coating;



means at said second loading station for loading cured articles on the mandrel in said inner array indexed into said second loading station;

means at said printing station for applying a coating of print to cured articles on the mandrel in said inner array indexed into said printing station, said printing means including a printing drum located wholly outwardly of said arrays and having a raised printing surface interpenetrating said outer array for contacting cured articles on said inner array, said raised printing surface covering only a portion of the circumference of said printing drum so that rotation of said printing drum carries said raised printing surface away from said arrays while the mandrels on said outer array index through said printing station whereby only articles on said inner array are printed; and

means at said second unloading station for removing printed articles on the mandrel in said outer array indexed into said station.

4,055,143

RELEASE MATERIAL APPLICATION SEAL

Louis R. Hattler, Marion, and Sukumaran K. Menon, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

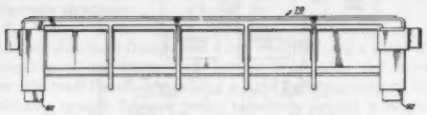
Filed Sept. 20, 1976, Ser. No. 724,446
Int. Cl.[2] B05C *11/04, 1/06;* **G03G** *15/20*
U.S. Cl. 118—60 **6 Claims**

1. An apparatus for applying a fluid release material to a fuser member in communication with a backup member as a sheet of support material having particles thereon passes therebetween with the particles contacting the fuser member, including:

a housing defining a chamber for storing a supply of release material in operative communication with the fuser member; and

a blade member disposed closely adjacent to the fuser mem-

ber for controlling the thickness of the layer of release material applied to the fuser member, said blade member comprising truncated triangular pads extending in an outwardly direction, substantially normal to the edge of



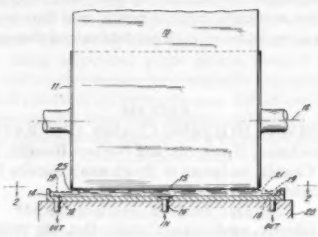
said blade member at opposed, spaced side marginal regions thereof, each truncated triangular pad being resiliently urged into engagement with the fuser member to prevent leakage of the release material thereat.

4,055,144

APPARATUS FOR MENISCUS COATING OF A MOVING WEB

Simon L. Chu, Dobbs Ferry; Robert Sharowsky, Hastings-on-Hudson, and Peter Shu, Yonkers, all of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Mar. 15, 1976, Ser. No. 666,814
Int. Cl.[2] B05C *5/02*
U.S. Cl. 118—401 **1 Claim**



1. Apparatus for coating a moving surface of aluminum substrate which comprises:

a. a pan having a longitudinally extending groove at the upper surface thereof, capable of containing a relatively elongated, shallow pool of a light sensitive coating solution;

b. level regulating fluid flow means interior to said pan continually supplying said coating solution to said pan in the absence of substantial turbulence at a rate at least 5% in excess of that required to support a meniscus between a surface of said aluminum substrate and the upper level of said pool, and evacuating a portion of said coating solution from said pan while maintaining the elevation of said coating solution at a substantially constant level, said fluid flow regulating means comprising at least one enlarged disturbance damping fluid inlet port located midway between the ends of the pan at the bottom level of said pan and at least two outlet ports located at the ends of the pan at the top level of said pan, said inlet and outlet ports being positioned in a plane containing said longitudinally extending groove and the longitudinal axis of said pan;

c. a roller, having a diameter at least four times the width of said pool at its upper surface, which supports said aluminum substrate by engaging one surface thereof to position the other side of said aluminum substrate close to and above the upper surface of said pool such that the space between said aluminum substrate and the upper pool surface is in the range of 15 to 35 mils; and

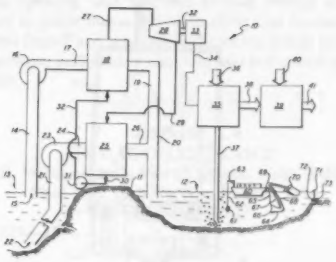
d. a menicus of said coating solution extending from the upper surface of said aluminum substrate such that the arc of aluminum substrate contacted by said meniscus of coating solution subtends an angle of no more than 20° measured from the longitudinal axis of said roller.

4,055,145

SYSTEM AND METHOD OF OCEAN THERMAL ENERGY CONVERSION AND MARICULTURE

David Mager, 20 W. 64th St., Amherst, Mass. 10023, and William E. Heronemus, 730 West St., New York, N.Y. 01002

Filed Sept. 29, 1976, Ser. No. 727,681
Int. Cl.[2] A01K *61/00*
U.S. Cl. 119—2 **29 Claims**



1. An integrated system of ocean thermal energy conversion and mariculture comprising:

a lagoon located adjacent to a deep ocean region having warm seawater at the surface of the region and nutrient-rich cold seawater at a predetermined depth below the surface, the surface seawater in said region having an average minimum temperature of at least about 21° C and the deep nutrient-rich seawater having an average maximum temperature of no more than about 10° C, the lagoon being stocked with a preselected species of edible marine fauna;

a passageway connecting the lagoon to the adjacent ocean region;

a closed loop power generating plant located adjacent to the lagoon, said closed loop containing a working fluid capable of operating in a Rankine cycle between the warm and cold seawater temperature, and said generating plant including

a first heat exchanger connected in said loop and having a separate seawater side;

means for delivering a stream of warm surface seawater from said ocean region to the seawater side of said first heat exchanger for evaporating the working fluid at a substantially constant first pressure;

a second heat exchanger connected in said loop and having a separate seawater side;

means for delivering a stream of cold nutrient-rich seawater from said predetermined depth of the ocean region to the seawater side of the second heat exchanger for condensing the working fluid at a substantially constant second pressure lower than said first pressure;

pumping means connected in said loop between the second and first heat exchangers for pumping the working fluid as liquid from the second heat exchanger at said second pressure to the first heat exchanger at said first pressure;

power generating means connected in said loop between the first and second heat exchangers for extracting useful work from the working fluid as a vapor expanding from said first pressure to said second pressure; and

conduit means having an inlet connected to the seawater sides of the first and second heat exchangers and an outlet into the lagoon approximately opposite the passageway connecting the lagoon with the adjacent ocean region for mixing the streams of cooled surface seawater from the first heat exchanger and the warmed nutri-

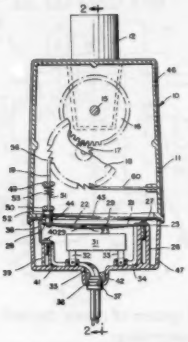
ent-rich deep seawater from the second heat exchanger and discharging the mixed streams into the lagoon at an optimum temperature for growth of said preselected marine fauna.

4,055,146

AUTOMATIC FEEDING APPARATUS

Thomas J. Smrt, Bartlett, Ill., assignor to Fox Valley Marking Systems, Inc., Cary, Ill.

Filed Aug. 30, 1976, Ser. No. 718,684
Int. Cl.[2] A01K *61/02*
U.S. Cl. 119—51.11 **7 Claims**



1. An automatic feeding apparatus comprising a frame, a hopper on the frame for holding material to be fed, valve means mounted on the frame below the hopper for feeding a discrete amount of material from the hopper, wheel means rotatably mounted on the frame for actuating the valve means, the wheel means including a ratchet wheel, an actuator reciprocably mounted on the frame and engageable with the ratchet wheel for intermittently rotating the ratchet wheel, a pair of electrical terminals adapted to be connected to a source of electric power, and a thermostatic metal strip connected to one of the terminals, the thermostatic metal strip being movable by thermal expansion and contraction between a first position in which the strip engages the other terminal and a second position in which the strip is out of contact with the other terminal, the strip completing a circuit between the terminals when the strip is in the first position whereby the strip is heated, the electric circuit being opened when the strip moves to the second position whereby the strips cools, the strip engaging and moving the actuator when the strip moves from one of its positions to the other of its positions whereby the ratchet wheel is rotated.

4,055,147

AUTOMATIC FLUID DISPENSER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Peter C. Sakellaris, Portland, Oreg.

Filed Oct. 8, 1975, Ser. No. 620,675
Int. Cl.[2] A01K *7/02*
U.S. Cl. 119—72.5 **11 Claims**

1. An automatic fluid dispensing apparatus comprising:

a. a supply of fluid to be dispensed;

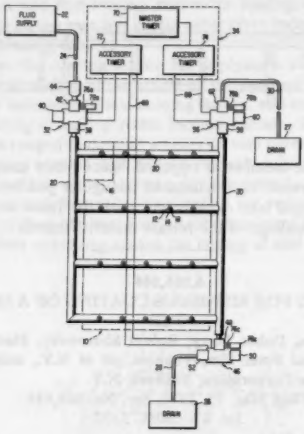
b. a drain for said fluid;

c. one or more individual fluid dispensing units each adapted to dispense fluid when sucked by a user;

d. conduit means for coupling said individual fluid dispensing units to said supply and to said drain;

e. first automatic control means adjacent said supply for causing a flow of the fluid from the supply to the individual fluid dispensing units during predetermined dispensing intervals and for preventing flow of the fluid from the supply to the dispensing units after completion of said predetermined dispensing intervals; and

f. second automatic control means to cause a flow to said drain, via said conduit means, of all fluid in said conduit



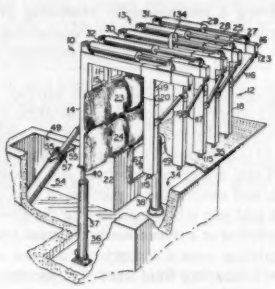
means except the portion between said fluid supply and said first automatic control means, said flow being caused at the completion of each predetermined dispensing interval.

4,055,148

ANIMAL HOLDING CLAMP APPARATUS

Arnold Brockman, Humboldt, and Norbert Beaujot, Saskatoon, both of Canada, assignors to Brockman's Service Ltd., Humbodt, Canada

Filed Oct. 24, 1975, Ser. No. 625,531
Claims priority, application Canada, Oct. 28, 1974, 212399
Int. Cl.[2] A01K *15/00*
U.S. Cl. 119—103 **23 Claims**



1. Animal immobilizing clamp apparatus comprising an elongate open three-sided framework of inverted "U" cross-sectional form comprising a top-wall frame and opposed side-wall frames of length and height sufficient to confine the sides of an animal to be immobilized, said framework having open ends and bottom, one side-wall frame comprising a rigid planar structure integrally joined with said top-wall frame, the other side-wall frame comprising a series of columns spaced apart horizontally and extending downwardly from said top wall frame, a first plurality of cushioned plate elements mounted on the inner side of each column, and a second plurality of cushioned plate elements mounted on the inner side of said rigid side-wall frame, means mounting said columns in said top-wall

frame for independent guided rectilinear movement of a column toward and away from said rigid side-wall frame, means for controllably moving each column to vary the spacings between opposed plate elements for clampedly engaging opposite sides of an animal and for releasing the animal, and means for connecting said apparatus is supported relation with a reference structure.

8. Animal immobilizing apparatus, comprising opposed elongate side-wall frames and a top-wall defining a three-sided animal-receiving framework having open ends and bottom, one side-wall frame comprising a rigid braced group of longitudinally spaced upright beam members having a height at least as high as the largest animal to be confined integrally joined with longitudinal bracing beam members, said top-wall frame comprising a plurality of transverse beam members, said upright beam members being integrally joined at their upper ends with the adjacent ends of corresponding transverse beam members, respectively, guide means carried by each transverse beam member, the other side-wall frame comprising an equal group of longitudinally-spaced upright cantilever beam members, each cantilever beam member carrying integral slide means mounted on a respective guide means for independent guided reciprocatory movement along said guide means toward and away from said rigid side-wall frame, animal clamping means comprising a plurality of plate elements mounted on the inner sides of said side-wall frames in closely adjacent spaced relation and distributed over substantially the entire inner areas thereof as at least two tiers having combined vertical span sufficient to cover the side of an animal, said plate elements each supporting a cushion body, powered motive means connected with said top-wall frame and with cantilever beam member for moving each cantilever beam member independently along associated guide means, control means for actuating said motive means for clampedly engaging the sides of an animal received between opposed tiers of cushion bodies and for disengaging from said animal, and means connecting said clamp apparatus for support by a reference structure.

4,055,149

NECK FRAME FOR CATTLE

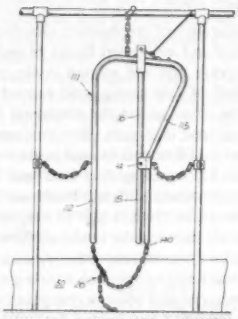
Adolf Haiges, Bonnigheim, Germany, assignor to Firma Suevia Haiges KG, Kirchheim, Germany

Filed Aug. 16, 1976, Ser. No. 714,502

Claims priority, application Germany, Aug. 14, 1975, 7525811; May 19, 1976, 2622172

Int. Cl.² A01K *1/06, 1/08*

U.S. Cl. 119—147 A **10 Claims**



1. A neck frame for cattle adapted to be suspended in a cattle stand comprising an essentially U-shaped frame including two generally vertically extending shanks and a connecting crosspiece, said frame defining an upper head opening adapted to receive the head of an animal and a lower neck opening for the neck of the animal, each of said shanks having a free end adjacent said neck opening, means flexibly connecting the free ends of said shanks and adapted to be connected to the floor of a stable for defining the lower portion of said neck opening, a closing lever having upper and lower free ends and being pivotally mounted near its midpoint on one of said shanks about an axis extending perpendicular to the plane of said frame, said lever having an upper closing arm and a lower actuation arm, said lever being pivotable from an open position wherein said closing arm is spaced from the other one of said shanks to permit the animal to pass its head through said head opening to a closed position wherein said closing arm approaches said other one of said shanks to prevent the animal from pulling its head out of the frame, means for automatically locking said closing lever in said closed position, said crosspiece comprising a generally horizontal portion extending over said head opening, said free end of said closing arm being connected to guide means movable along said horizontal portion of said frame, and wherein said locking means is interconnected between said guide means and said horizontal portion of said frame.

4,055,150

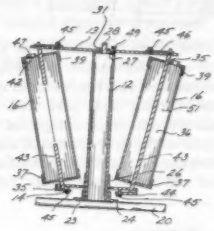
ANIMAL OILER DEVICE

Richard R. Williams, P.O. Box 25, Ithaca, Nebr. 68033

Filed July 16, 1976, Ser. No. 683,988

Int. Cl.² A01K *29/00*

U.S. Cl. 119—157 **7 Claims**



1. An animal oiler device comprising:

a base member;

an upright shaft secured to said base member;

a pair of spaced generally horizontally disposed plates rotatably mounted on said shaft;

a plurality of spaced generally upright post means rotatably mounted between said plates, each post means having a reservoir formed therein form containing oil and each post means having means formed therein to permit the oil to seep from the reservoir to the surface thereof.

4,055,151

WASTE HEAT BOILER

Robert James Cummings, Morpeth, England, assignor to Clarke Chapman, Ltd., England

Division of Ser. No. 496,673, Aug. 12, 1974, abandoned. This application Aug. 25, 1976, Ser. No. 717,834

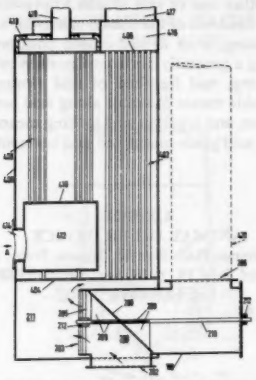
Claims priority, application United Kingdom, Aug. 21, 1973, 39405/73; Sept. 8, 1973, 42326/73

Int. Cl.² F22B *1/18*

U.S. Cl. 122—7 B **10 Claims**

1. A boiler comprising a housing, a boiler heat exchange zone within the housing, a duct bypassing said heat exchange zone, a valve within said housing and comprising wall means defining a valve chamber, a valve member and means mounting said valve member for rotation in said valve chamber about an axis extending centrally of said valve chamber between first and second positions, said valve member having peripheral surface means in sealing relationship with said wall means including opposite end portions in sealing relationship with respective portions of said wall means which are separated both peripherally and longitudinally of said valve chamber,

said wall means defining a first outlet port leading to said heat exchange zone and a second outlet port leading to said duct bypassing said heat exchange zone and an inlet port which is put in communication only with said first outlet port by rotation of said valve member about said axis to said first position, said inlet port being put in communication only with said second port by rotation of said valve member about said axis to said second position, and said inlet port being put in communi-



cation with both said outlet ports by rotation of said valve member about said axis to any intermediate position between said first and second positions, said valve member in any of said intermediate positions cooperating with said wall means to define two passage means respectively contiguous with said boiler and said duct, the ratio of the proportions of said passage means being variable in response to said rotation of said valve member between said first and second positions.

4,055,152

GAS BOILER, PARTICULARLY FOR CENTRAL HEATING

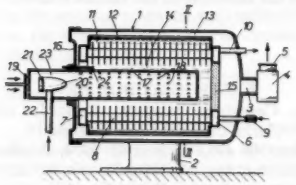
Maurice Vidalenq, 27, rue du Marechal Joffre, 78430 Louveciennes, France

Filed June 7, 1976, Ser. No. 693,627

Claims priority, application France, June 9, 1975, 75.17959; Apr. 21, 1976, 76.11692

Int. Cl.[2] F22B *15/00, 37/10*; F23L *17/00*

U.S. Cl. 122—235 R **19 Claims**



1. A gas-burning boiler comprising

a boiler chamber,

walls defining said boiler chamber,

a plurality of heat-exchanger tubes arranged in said chamber, the heat exchanger tubes being parallel to each other,

an outlet for gases from the chamber in one of said walls,

an extraction fan in said outlet,

a burner unit mounted in said chamber and penetrating an aperture in one of said walls,

the burner unit comprising an inlet for combustion air gas fuel into the chamber,

ignition means in said chamber for igniting the combustion air and gas fuel,

a flame surface of said burner unit extending between the heat exchange tubes of the plurality of heat exchange tubes and generally parallel to them and baffle means in said chamber for defining a gas flow path from the burner unit to the fan such that hot gases flow from said flame surface substantially equally over each of the plurality of heat exchanger tubes, whereby upon operation of the extraction fan combustion air and gas fuel are drawn into the chamber and ignited there under a sub-atmospheric pressure.

4,055,153

FUEL SUPPLY SYSTEM FOR A ROTARY PISTON ENGINE

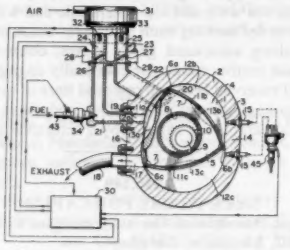
Toshiyuki Kono, Toyoake, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 12, 1975, Ser. No. 631,391

Claims priority, application Japan, Aug. 15, 1975, 50-99387

Int. Cl.[2] F02B *53/10*

U.S. Cl. 123—8.09 **5 Claims**

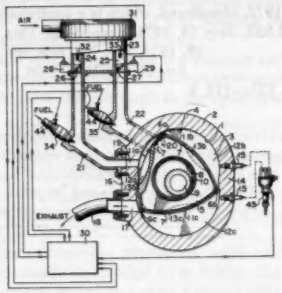


1. A rotary piston engine comprising a casing composed of a rotor housing having a trochoidal inner peripheral surface and side housings which close opposite ends of said rotor housing, a polygonal rotor adapted to rotate eccentrically in said casing with apex portions thereof sliding over said trochoidal surface thereby defining a plurality of combustion chambers between said trochoidal surface and individual flanks of said polygonal rotor, said casing having first and second intake ports which open in the inner wall of said casing, said second port being positioned so as to be advanced in the rotational direction of said rotor relative to said first port, first and second intake systems connected to said first and second ports, respectively, fuel injection means for injecting fuel into said first intake system, first and second means to detect intake air flow rate in said first and second intake systems and to despatch first and second flow rate signals showing the intake air flow rate in said first and second intake systems, respectively, means to detect the rotation of said rotor and to despatch a timing signal showing the rotational timing of said rotor, a computer which operates depending upon said first and second flow rate signals and said timing signal to produce a series of fuel injection signals for actuating said fuel injection means in a manner that the duration and timing of the fuel injection in said first intake system are determined by said flow rate signals and said timing signal, respectively, wherein said duration is cyclically altered for every sequential suction stroke performed by said plurality of combustion chambers so as to charge the individual combustion chambers with a relatively rich fuel-air mixture or a relatively lean fuel-air mixture.

4,055,154
FUEL SUPPLY SYSTEM FOR A ROTARY PISTON ENGINE

Toshiyuki Kono, Toyoake, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 12, 1975, Ser. No. 631,414
Claims priority, application Japan, Aug. 15, 1975, 50-99388
Int. Cl.[2] F02B *53/10*
U.S. Cl. 123—8.09 5 Claims



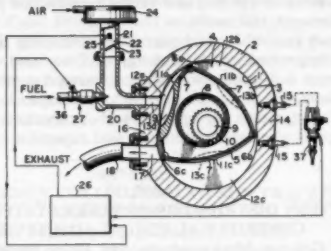
1. A rotary piston engine comprising a casing composed of a rotor housing having a trochoidal inner peripheral surface and side housings which close opposite ends of said rotor housing, a polygonal rotor adapted to rotate eccentrically in said casing with apex portions thereof sliding over said trochoidal surface thereby defining a plurality of combustion chambers between said trochoidal surface and individual flanks of said polygonal rotor, said casing having first and second intake ports which open in the inner wall of said casing, said second port being positioned so as to be advanced in the rotational direction of said rotor relative to said first port, first and second intake systems connected to said first and second ports, respectively, first and second fuel injection means for injecting fuel into said first and second intake systems, respectively, first and second means to detect intake air flow rate in said first and second intake systems and to dispatch first and second flow rate signals showing the intake air flow rate in said first and second intake systems, respectively, means to detect the rotation of said rotor and dispatch a timing signal showing the rotational timing of said rotor, a computer which operates depending upon said first and second flow rate signals and said timing signal to produce a first and second series of fuel injection signals for actuating said first and second fuel injection means in a manner that the duration and timing of the fuel injection in said first intake system are determined by said first flow rate signal and said timing signal, respectively, that the duration and timing of the fuel injection in said second intake system are determined by said second flow rate signal and said timing signal, respectively, and that said first fuel injection means is actuated for every sequential suction strokes performed by said plurality of combustion chambers while said second fuel injection means is actuated for only cyclically selected ones of said sequential suction strokes performed by said plurality of combustion chambers.

4,055,155
FUEL SUPPLY SYSTEM FOR A ROTARY PISTON ENGINE

Toshiyuki Kono, Toyoake, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 12, 1975, Ser. No. 631,415
Claims priority, application Japan, Aug. 15, 1975, 50-99386
Int. Cl.[2] F02B *53/10*
U.S. Cl. 123—8.09 5 Claims

1. A rotary piston engine comprising a casing composed of a rotor housing having a trochoidal inner peripheral surface and side housings which close opposite ends of said rotor housing, a polygonal rotor adapted to rotate eccentrically in said casing with apex portions thereof sliding over said trochoidal surface thereby defining a plurality of combustion chambers between said trochoidal surface and the individual flanks of said polygonal rotor, an intake port which opens in the inner wall of said casing, an intake manifold connected to said intake port for supplying air therethrough, a fuel injection means for injecting fuel into said intake manifold, means for detecting the intake air flow rate and for dispatching a first signal showing the intake air flow rate, means for detecting the rotation of said rotor and

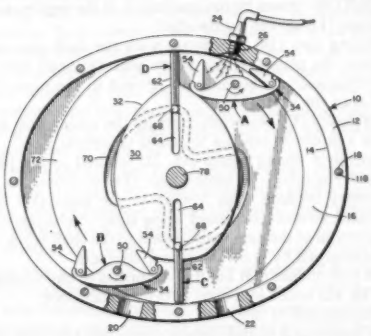


for dispatching a second signal showing the rotational timing of said rotor, a computer which operates, depending upon said first and second signals, to produce a series of fuel injection signals for actuating said fuel injection means in a manner such that the duration and timing of the fuel injection are determined by said first and second signals, respectively, and that the duration is further modified to be relatively long or short with respect to individual fuel injections according to a predetermined order so as to selectively produce a relatively rich fuel-air mixture of about **11-12** air/fuel ratio or a relatively lean fuel-air mixture of about **18-19** air/fuel ratio.

4,055,156
ROTARY ENGINE

Hugo A. Terán Salguero, La Paz, Bolivia, assignor to Gundlach, S.A., Bolivia

Filed Mar. 12, 1976, Ser. No. 666,500
Int. Cl.[2] F02B *53/08*
U.S. Cl. 123—8.33 15 Claims



1. An internal combustion engine of the rotary type comprising:

inner and outer housings and housing side plates having surfaces defining an annularly disposed working chamber,

intake and exhaust openings in communication with said working chamber for permitting admission of combustible gases and exhaust of the products of combustion,

first and second valves substantially oppositely positioned in said chamber for dividing said chamber into a compression zone and an expansion zone,

at least one piston mounted in said chamber, means for effecting orbital movement of said piston within said chamber, said piston being movable relative to said inner and outer housings, said piston being operable to compress a charge of combustible gases while moving through said compression zone and to be driven through said expansion zone by the action of said combustible gases when ignited therein,

power output means connected to said piston and driven thereby as said piston moves through said expansion zone,

valve actuating means connected to said first and second valves for opening said valves to allow said piston to pass between said zones,

means carried by said piston for containing the charge of compressed combustible gases from said compression zone and transporting said compressed combustible gases from said compression zone to said expansion zone, and

ignitiion means for igniting said compressed combustible gases when said piston is in said expansion zone.

4,055,157

IGNITION DISTRIBUTOR-BREAKER SYSTEM HAVING CENTRIFUGAL TIMING ADJUSTMENT

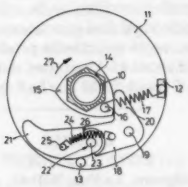
Thilo Gehring, Markgroningen, and Heinz Berger, Stuttgart, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed May 25, 1976, Ser. No. 689,749

Claims priority, application Germany, Aug. 21, 1975, 2537138

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 R **6 Claims**



1. Ignition distributor-breaker system for the timing of an ignition event in internal combustion engines, with centrifugal timing adjustment having

a shaft **(10)** driven by the crankshaft of the engine; a support plate **(11)** driven by the shaft;

a timing cam **(14)** concentric with the shaft and rotatable with the plate **(11)** and hence with the shaft while being additionally rotatable with respect to the plate **(11)** and hence the shaft **(10)**;

bias means **(17)** resiliently biassing the timing cam to rotate in a direction tending to retard the spark;

centrifugal timing means **(18, 21)** secured to the plate **(11)** and engaging the timing cam **(14)** to adjust its relative rotary position with respect to the plate **(11)** to effect spark advance or retard upon relative change of rotary position of the cam with respect to the shaft when the cam is engaged by ignition breaker contacts;

and limit means **(13)** limiting excursion of the timing means **(18, 21)** under influence of centrifugal force

characterized in that

the centrifugal timing means comprises two link elements **(18, 21)**, one **(18)** of which engages the timing cam **(14)**;

and a knee joint **(22, 26)** and spring means **(24)** connecting said link elements **(18, 21)**, said link elements forming a single centrifugally deflectable unit below a critical speed, the centrifugal force above said critical speed overcoming the connecting force of said spring means and permitting the other **(21)** of said link elements to deflect about the limit means **(13)** and thus break the deflecting unity of the link elements **(18, 21)** and permit rotation of the said one link element **(18)** with respect to the other **(21)** and consequently rotation of the timing cam **(14)** in the direction of spark retardation under the influence of the bias means **(17)**.

4,055,158

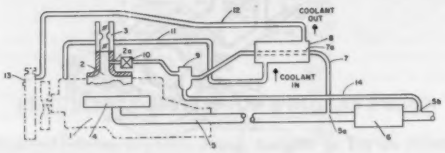
EXHAUST RECIRCULATION

Frederick J. Marsee, Clawson, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 458,508, April 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 304,735, Nov. 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 162,853, July 15, 1971, abandoned. This application Mar. 19, 1976, Ser. No. 668,589

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **7 Claims**



1. In a spark ignited internal combustion engine having a carburetor type fuel/air induction system and an exhaust system, said engine having an exhaust recycle passage through which a portion of the exhaust gas is recycled from said exhaust system to said fuel/air induction system thereby lowering the nitrogen oxides content of the exhaust gas emitted by said engine, the improvement comprising a liquid-cooled heat exchanger in said exhaust recycle passage whereby exhaust gas flowing through said recycle passage passes through said heat exchanger and comes into heat exchange contact with the cooled surfaces within said liquid-cooled heat exchanger and is cooled below about 250° F, said heat exchanger comprising a heat exchanger housing through which said recycle exhaust gas passes and comes into heat exchange contact with a liquid-cooled surface, said housing having a drain opening at a low point, said drain opening being connected by a drain conduit to said exhaust system at a location downstream from where said exhaust recycle passage connects to said exhaust system, said recycle passage being connected to deliver cooled recycle exhaust to said fuel/air induction system downstream from the throttle plate of said carburetor whereby the nitrogen oxide content of said exhaust gas is lowered to an extent substantially greater than that obtained without said cooling.

4,055,159

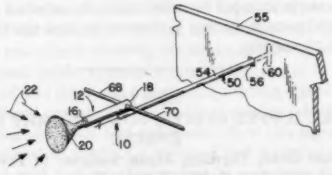
GAS SAVING DEVICE

Luciano Cappiello, 52 Sunset Drive, Shelton, Conn. 06484

Filed Sept. 8, 1976, Ser. No. 721,402

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 B **10 Claims**



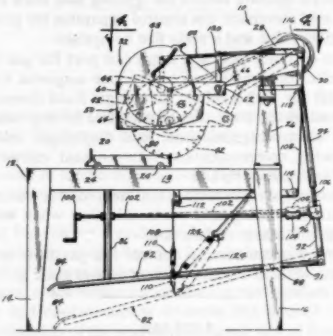
1. An auxilliary air inlet device for internal combustion engines in motor vehicles, comprising:

a. elongated tubular housing means adapted to be mounted relative to the combustion engine,

b. a replaceable air filter,

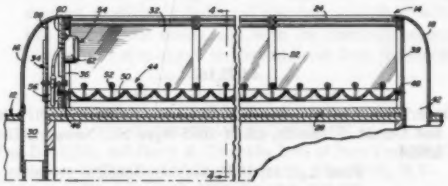
c. mounting means for removably connecting one end of said air filter to one end of said housing means,
d. means for connecting said housing means in spaced relation to said air filter to the carburetor and P.V.C. valve of the motor vehicle,
e. a valve mounted within said housing means and adapted to be moved between an open position permitting the flow of air therethrough t a closed position preventing the flow of air therethrough, said valve including:
1. a valve member having an exterior surface conforming to the interior configuration of said housing means in the closed position of the valve, and
2. inlet passages extending across the exterior surface of said valve member in spaced relationship to each other for the air to flow therethrough in the open position of said valve,
f. lever means operatively associated with said valve member, said lever means including a lever arm having a free end and a fixed end thereof coupled to the axis of said valve member for angular rotation thereof within said housing means between the open and closed respective positions, and
g. control means operatively associated with said lever means to be manually controlled from within the motor vehicle, said control means including a control link pivotably coupled to said free end of said lever arm and having the other end thereof extending into the vehicle to control therefrom.

4,055,160
TABLE SAW
Harry R. Wilson, 1410 Pin Oak Drive, Cedar Falls, Iowa 50613
Filed Apr. 29, 1976, Ser. No. 681,448
Int. Cl.[2] B28D *1/04*
U.S. Cl. 125—13 SS **16 Claims**



1. A table saw comprising:
a table having an upstanding post on which a saw arm having a saw blade on its outer free end is pivotally mounted for pivotal movement between raised and lowered positions,
a foot lever having a foot engaging end and an opposite end pivotally connected under said table to said table with the pivotal axis between said foot engaging end and said opposite end for vertical pivotal movement,
an upstanding link connected at one end to said opposite end of said foot lever and at the other end to said saw arm on the opposite side of said saw arm pivotal axis from said saw blade such that said foot lever and said saw arm pivot in substantial parallel relationship to raise and lower the outer free end of said saw arm relative to said table whereby said saw blade on the outer free end of said saw arm moves towards and away from a work piece on said table,
a blade guard having a top saw guard covering the top half of said saw blade pivotally connected to said saw arm and a bottom saw guard pivotally connected to said saw arm by being pivotally connected to said top guard for pivotal movement of said blade guard between raised and lowered positions relative to said saw blade with said blade being protected by said guard when said guard is in its lowered position and being exposed when in its raised position,
leveling means connected between said saw arm and said top guard to maintain said top guard level as said saw arm is raised and lowered, and
cable means connected to said foot lever between said pivotal axis of said foot lever and said foot engaging end and extending upwardly into engagement with said bottom guard at a point on the opposite side of said pivotal axis for said bottom saw guard from said saw blade such that said bottom guard pivots in a direction opposite to the pivotal movement of said saw arm relative to said table.

4,055,161
SOLAR ENERGY COLLECTOR AND SUN TRACKING CONCENTRATOR
Robert L. Jones, 3410 Truman, El Paso, Tex. 79930
Filed Dec. 16, 1975, Ser. No. 641,242
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **19 Claims**



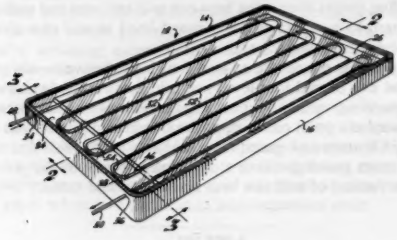
1. In combination with an energy collector receiving radiant energy from a moving source, automatic tracking means including means mounting said collector for movement along a predetermined path, fluid sensing means for producing a differential fluid pressure in response to reception of said radiant energy from the source reflecting movement thereof, and gravitational drive means connected to the fluid sensing means for imparting said movement to the collector in response to said differential fluid pressure, said gravitational drive means including a balancing tube having opposite inlet ends, means pivotally mounting the tube for angular movement about a fixed axis, a separating mass displaceably retained within said tube intermediate said inlet ends, conduit means connecting the fluid sensing means to the inlet ends of the tube for displacement of said mass to shift the center of gravity of the tube relative to said fixed axis, and gear means drivingly connecting the tube to the collector for transmitting said angular movement of the tube in response to the differential fluid pressure appiied to the inlet ends of the tube.

15. In combination with a transparent housing having a longitudinal axis, an energy concentrator comprising a curved reflector, a transparent panel connected to said reflector to enclose a heat receiving chamber, a heat absorbing tube and means connected to said panel for suspending the tube therefrom in parallel relation to said longitudinal axis within the heat receiving chamber.

4,055,162
SOLAR ENERGY COLLECTOR
Ed Gonzalez, 2284 NE. 1st Ave., Boca Raton, Fla. 33432
Filed Apr. 26, 1976, Ser. No. 679,898
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **10 Claims**

1. A solar collector comprising:
an open shell, said shell comprising a rim with an outer

downwardly extending skirt terminating at a support surface, and a floor within the skirt, said floor having a first end zone and a second end zone between the floor and the support surface defining spaced lower end floor zones and said shell including a septum spanning the skirt between the lower floor zones and the support surface



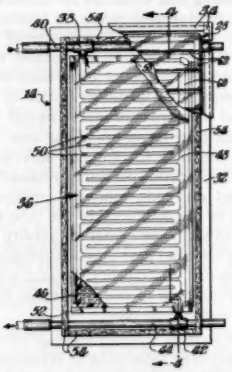
defining a space between the floor and septum, and said floor having a plurality of elongate, spaced, parallel recessed portions of generally U-shaped, cross section extending between the end zones, and the base zone of the recessed portions being semi-circular in cross section and of a predetermined radius of curvature, and said shell having an inlet and outlet opening.

4,055,163

SOLAR HEATING SYSTEM

Frederick A. Costello; James L. Manniso; Anthony J. DiPinto, and Gerald W. Smith, all of 1605 Ayre St., Newport, Del. 19804

Filed Apr. 16, 1975, Ser. No. 568,436
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **3 Claims**



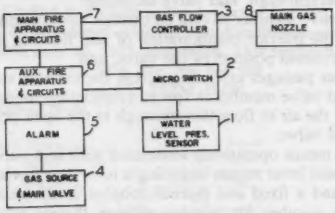
1. A heating system comprising a solar heating panel, black fluid, and means for selectively circulating the black fluid through the heating panel, the panel including an enclosure having a light-transmitting upper surface, a light-transmitting conduit within the enclosure closely arranged in serpentine fashion through which the black fluid selectively circulates, and a reflective surface directly under the conduit arrangement substantially completely masked by that arrangement when black fluid is circulated therethrough and substantially completely unmasked when no black fluid is circulated therethrough, and wherein the enclosure is sealed, and the interior thereof is at least partially filled with a gas having a thermal conductivity lower than that of air.

4,055,164

APPARATUS FOR AUTOMATIC GAS IGNITION CONTROL

Tu Wu-Heng, No. 33 Sec, 3, Ming-Teng Road, Jui-Fang Chen, Taipei Hsien, China /Taiwan

Filed July 9, 1976, Ser. No. 704,109
Int. Cl.[2] F24H *1/00*
U.S. Cl. 126—351 **8 Claims**



1. An apparatus for automatic gas ignition control which comprises:

a. a water level sensor, micro switch, and gas flow controller for regulating the gas flow in accordance with changes in water level above a predetermined water level, said micro switch changing states when the water falls below said predetermined level;

b. an alarm mechanism including pressure measuring means, said mechanism indicating when the gas pressure upstream of said controller is below a predetermined level;

c. automatic gas control apparatus for controlling an auxiliary fire and a main fire, connected to said gas flow controller;

d. a high voltage electric ignition circuit for igniting said auxiliary fire;

e. an electric ignition circuit for igniting said main fire; and

wherein said automatic gas control apparatus for producing an auxiliary fire and a main fire comprises

a. a gas entrance port and a gas exit port for gas flow;

b. an electromagnetic coil to produce magnetic force;

c. a steel bar with a rubber diaphragm fixed thereon to be moved by the attraction of magnetic force produced by said electromagnetic coil, said diaphragm selectively allowing communication between said entrance port and said exit port; and

d. a tension spring to restore said steel bar back to its initial position blocking said communication when said magnetic coil ceases to function;

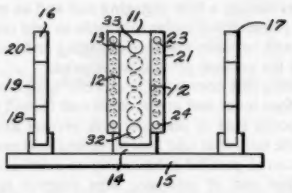
to thereby automatically control the gas flow in accordance with an electric current in said coil.

4,055,165

CARBONACEOUS BOILER

Robert L. Scragg, and Alfred B. Parker, both of 2937 SW. 27th Ave., Miami, Fla. 33133

Filed Dec. 19, 1974, Ser. No. 534,588
Int. Cl.[2] F24H *7/00*
U.S. Cl. 126—400 **6 Claims**



1. A boiler comprising a block of low permeability, imperious silicon carbide having relatively large radiation receiving side surfaces and a relatively small depth dimension, a first

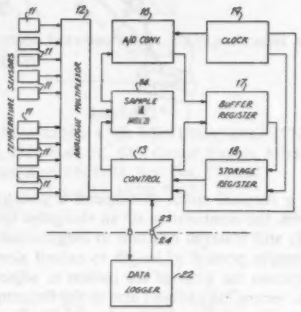
fluid conducting channel formed in said block in the form of a grid so that said channel passes in proximity to a substantial portion of said radiation receiving sides of said block, a counter flow heat exchanger block positioned proximate said channel in said block, said counter flow block having a second channel for conducting a high temperature fluid in said heat exchanger block in the opposite direction to the flow of fluid in said first fluid conducting channel to thereby exchange heat with the fluid in said first conducting block, and means for directing infrared radiation onto at least one of said radiation receiving side surfaces of said block, said block efficiently absorbing said radiation and conducting said absorbed radiation energy to said channel to heat the fluid passing therethrough.

4,055,166

APPARATUS FOR MAKING SURFACE TEMPERATURE MEASUREMENTS ON THE HUMAN BODY

Hugh Walter Simpson, 2 Kirklee Terrace, Glasgow, and Douglas Green, 1 Kingsmill Drive, Kennoway, both of Scotland

Filed July 9, 1975, Ser. No. 594,555
Int. Cl.[2] A61B *5/00*; G01K *1/02*
U.S. Cl. 128—2 H **14 Claims**



1. Apparatus for measuring surface temperatures at points in a region of the human body, including

a garment,

a plurality of temperature sensors in the form of semiconductor junctions located in the garment at spaced apart positions,

means for storing signals representing output signals from the sensors, control means for passing said signals representing output signals from the sensors to said storing means, clock means for producing clock pulses for actuating said control means whereby the time of occurrence relationship of the said output signals stored in said storing means is retained, the storing means, control means, and clock means being integral with the garment.

4,055,167

CURETTEMENT DEVICE

Dell L. Bernstein, 1295 Colorado Blvd., Denver, Colo. 80206

Filed Apr. 23, 1976, Ser. No. 679,675
Int. Cl.[2] A61B *1/00, 17/22*; A61M *1/00*
U.S. Cl. 128—2 B **6 Claims**

1. A cannula for uterine curettement comprising:

a. a straight, rigid tube proportioned for insertion into the uterus with an excess of length to provide a handle section and a connective section therebeyond for the connection of a suction tube;

b. an enlargement at the handle section to facilitate gripping of the tube;

c. a flattened, thin walled, closed end permanently affixed at the insert end of the tube; and

d. a first opening, having a width slightly less than the tube diameter, immediately adjacent to the flattened end of the tube and a second opening of approximately the dimensions of the first opening, axially spaced along the tube from the first opening and on the opposite side of the tube

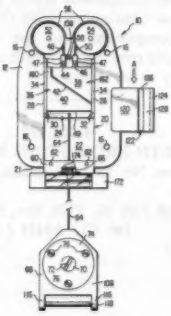
from the first opening with the edges of the openings squared, moderately sharp and generally smooth to facilitate curettement action, and with the openings proportioned to receive blood, serum and tissue from the uterus.

4,055,168

POSTURE TRAINING DEVICE

Neal E. Miller, and Barry R. Dworkin, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Filed Sept. 21, 1976, Ser. No. 725,231
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—2 S **15 Claims**



1. A posture training device to be worn by a person so as to improve the person's posture, comprising:

first harness cable means disposed about the longitudinal axis of the torso of the person and having a length which is variable depending upon a change in the posture of said person and/or a change in the underlying curvature of the spinal column, as well as upon a change in the degree of respiration of said person;

second harness cable means disposed transversely about the upper torso of said person and having a length which is variable depending upon a change in the degree of respiration of said person;

signal emitting means for emitting a signal when said person assumes a poor postural condition or position so as to

indicate to said person the assumption of said condition or position;

electrical control means operatively connected to said first and second harness means for controlling an electrical circuit including said signal means; and

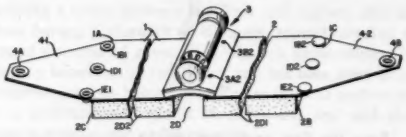
means for correlating the changes in length of said first and second cable means such that said electrical control means will activate or deactivate said signal means only when the change in length in said first cable is due to a change in the posture and/or underlying curvature of the spinal column of said person.

4,055,169

VIBRATING STRAP

Richard E. Baker, and Elizabeth F. Baker, both of 2701 Arlington Blvd., Apt. 101, Arlington, Va. 22201

Filed Mar. 25, 1976, Ser. No. 671,072
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—32 **5 Claims**



1. A VIBRATING STRAP comprising:

a strap-like outer component more or less rectangular in shape, thin, flexible, and provided with securing means at each end which hold said component so that its inner surface is oriented around and/or over areas of the human body to be vibrated;

subterminal snap-like means for securing together the two ends of said strap-like outer component so that said vibrating strap can be oriented and secured around a much smaller member of said human body to be vibrated;

centrally located means for securing a standard vibrator over the outer surface of said component; and

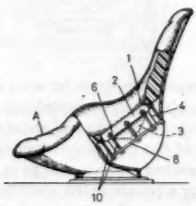
a pad-like inner component which is soft and resilient, the outer surface contiguous with the inner surface of said strap-like component, and the inner surface oriented around and/or over and in direct contact with areas of the human body to be vibrated.

4,055,170

HEALTH PROMOTING APPARATUS

Ryotaro Nohmura, No. 19-19, 3-chome, Senriyama-nishi, Suita, Osaka, Japan

Filed July 22, 1976, Ser. No. 707,606
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—33 **4 Claims**



1. An apparatus for health promotion comprising:

a hollow supporting structure for supporting a human body resting on said apparatus, said supporting structure formed with an opening at a seat portion on which the occupant rests,

a tubular member mounted inside said supporting structure so as to be directed toward said opening,

flexible sheet means stretched over the upper end of said tubular member so as to close said opening;

means for pretensioning said flexible sheet means; and

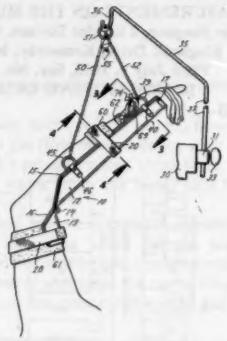
a loudspeaker mounted inside said tubular member so as to be slightly spaced from, and directed toward, said flexible sheet means, whereby sound vibrations eminating from said loudspeaker cause said flexible sheet means to vibrate.

4,055,171

SPLINT

Douglas A. Ries, St. Louis, Mo., assignor to Edward M. Ring, St. Louis, Mo., a part interest

Filed July 19, 1976, Ser. No. 706,743
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—87 R **14 Claims**



1. In a surgical splint to suspend a patient's arm during operations, the combination of: an elongated splint member of relatively stiff material resistant to longitudinal collapse, having a forearm portion of length to extend along the forearm from adjacent the wrist of the patient to adjacent the elbow; means to secure the patient's arm to the forearm portion of the splint member against slippage longitudinally of the member when the member with the arm is raised; at least one elongated flexible connector attached at one end to the splint adjacent the wrist end and attached at its other end to the splint member adjacent the elbow end thereof; a suspending support extending above the splint and vertically adjustable, the support having a hanger element onto which the connector is hung, and across which the connector may be moved to change the ratio of the distance along the connector from the hanger to the elbow relative to the distance from the hanger to the wrist, as the suspending support is raised and lowered without raising the body of the patient.

4,055,172

NAIL AND SET FOR CORRECTLY RESETTING FRACTURED BONES FOR THEIR IMMEDIATE RE-USE

Josef Ender, Steinbrecherring 23,A, 4400 Steyr, and Hans-Georg Ender, Ferstelgasse 6/20 A, 1090 Vienna, both of Austria

Continuation of Ser. No. 477,418, June 7, 1974, abandoned. This application Apr. 17, 1975, Ser. No. 568,987
Claims priority, application Austria, July 18, 1973, 6344/73
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—92 BC **8 Claims**

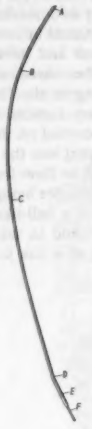
1. A curved nail for repositioning and fixing fragments of bones, such as leg bones from below and permitting rotational elastic penetration of its proximally-driven end into the upper portion of the bone, such as the femur head comprising:

a proximal end,

a curved relatively thin, flexible and resilient portion extending from said proximal end,

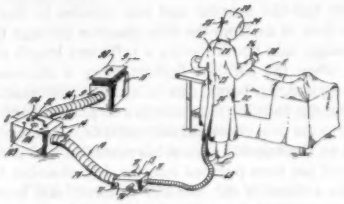
a distal end provided with a coupling element adapted to be connected to means for driving the nail, said nail being

straightened as it is driven through the medullary canal, and an initial stress being thus imparted to it, and



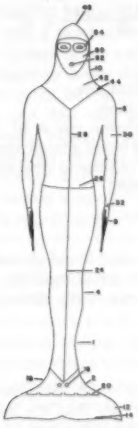
a straight portion between said coupling element and said curved portion.

4,055,173
SURGICAL MASKING AND VENTILATING SYSTEM
James V. Knab, 2916 Hall St., SE., Grand Rapids, Mich. 49506
Filed Apr. 21, 1975, Ser. No. 570,237
Int. Cl.[2] A62B 7/02
U.S. Cl. 128—139 **24 Claims**



12. A surgical masking and ventilating system for protecting an operating zone from contaminants emanated by members of a surgical team comprising protective apparal for substantially isolating each said member from the environment of the operating zone, said apparel for each member including a transparent visor, said visor having an arcuate front portion and a flat flange about the periphery of said arcuate portion, a headpiece for supporting said visor on the head of a member, said headpiece having an adjustable horizontal band of flexible material, a rigid arcuate shaped visor support having terminal ends thereof secured to said horizontal band at diametrically opposed portions thereof and extending outwardly in spaced relation from said horizontal band and thereby, from the head of the member upon which it is positioned for supporting said visor a distance from the front of said head, means for releasably securing said visor to said visor support, said releasable visor securing means including a plurality of snap members secured on said visor support in spaced relationship to each other, said visor having a plurality of correspondingly spaced apertures positioned along the upper periphery of said flange which receive said support snap members when said visor is positioned on said support, at least one fastening member releasably fastened on said support snaps to retain said visor in place, a hood positioned over said visor and extending at least to shoulder length, a gown positioned over the shoulder portion of said hood and extending at least to knee level, said hood having a front aperture within which said visor arcuate portion is positioned, means for maintaining the periphery of said front aperture firmly against said visor, an aspirator, conduit means connecting said aspirator to said apparel of each member, said conduit means including a suction tube extending in a loop about the mouth of the visor with the opposite ends positioned at the back side of the user and means coupling said suction tube ends to said aspirator, means for releasably fastening the looped portion of said suction tube to said visor, said aspirator being operative to generate a vacuum in said conduit that draws air and contaminants within said apparel into said conduit and away from said operating zone, and means for filtering the air drawn from said apparel a substantially contaminant free condition prior to its discharge into the environment of the operating zone.

4,055,174
SWIMMING SYSTEM
Kenneth W. LeVasseur, 1129 Ala Moana Bl., Honolulu, Hawaii 96814
Division of Ser. No. 471,545, May 20, 1974, Pat. No. 3,934,290.
This application Dec. 22, 1975, Ser. No. 643,163
Int. Cl.[2] A62B 7/00
U.S. Cl. 128—142.5 **12 Claims**

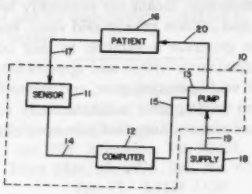


1. Swimming apparatus comprising a helmet, viewing means in the front portion of said helmet adapted to lie over the eyes of a swimmer the helmet having an annular cushion means generally surrounding a neck area of the helmet for forming a streamlined curve between a top of a head and shoulders of the wearer, the helmet further defining a blow-hole in a rearward portion of the helmet, a mouthpiece mounted on the front portion of the helmet below said viewing means and adapted to cover the mouth area of a swimmer, snorkel tube means leading forward from the blow-hole forward through the annular cushion to the mouthpiece, the snorkel tube means having a first open end connected to the blow-hole and a second open end connected to the mouthpiece and a neck surrounding fastening means being connected to a lower surface of the helmet.

4,055,175
BLOOD GLUCOSE CONTROL APPARATUS

Anton Hubert Clemens, Elkhart, and Robert Weston Myers, Mishawaka, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed May 7, 1976, Ser. No. 685,881
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—213 **4 Claims**



1. Apparatus for controlling the concentration of glucose in the blood stream of a subject by controlled supply of insulin to such subject dependent upon both the particular concentration of glucose in said blood stream and the rate of change of said blood glucose concentration comprising means for determining serial values of blood glucose concentration and for providing computer input signals corresponding to said serial values; computer means coupled to receive said serial input signals, said computer means being programmed to provide output signals based upon said serial input signals; and pump means responsive to said output signals for supplying insulin to such subject at a rate determined by said output signals; said computer being capable of deriving output signals from serial input signals in accordance with an equation of the form

$$IR = RI\left(\frac{G + GD - BI}{QI} + 1\right)^4$$

wherein

IR = calculated insulin infusion rate
BI = basal glucose concentration
RI = desired basal insulin infusion rate at BI
G = measured previous serial blood glucose reading and BI, RI, and QI are preselected values and wherein if the blood glucose concentration is rising

$$GD = (K_R A^2 10) + 6A$$

wherein A is the average change in blood gulcose concentration over several previous serial readings and K_R is a preselected value and wherein if the blood glucose concentration is falling

$$GD = (K_F A^2 10) + 6A$$

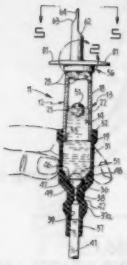
wherein A is the same as above and K_F is a preselected value which is different from and less than K_R, said GD being substracted from G in the above equation when the blood glucose concentration is falling.

4,055,176
UNIVERSAL DRIP CHAMBER AND SPIKE ASSEMBLY

Ingemar H. Lundquist, Oakland, Calif., assignor to Valleylab, Boulder, Colo.

Filed May 24, 1976, Ser. No. 689,114
Int. Cl.[2] A61M 5/16
U.S. Cl. 128—214 C **7 Claims**

1. In a universal drip chamber and spike assembly for use with a source of liquid in a container having a neck with a permeable stopper disposed in the neck and for use with a tube connected to a patient, a drip chamber body defining the upper portion of a drip chamber, said body having a relatively rigid substantially transparent wall surrounding the upper portion of the drip chamber and being open at its lower end, a drip chamber booth formed of a flexible rubber-like material secured to the lower end of said drip chamber body and defining a lower portion of the drip chamber, said booth having an outlet flow passage in its lower extremity in communication with the drip chamber and adapted to be placed in communication with the tube connected to the patient and having means forming a valve seat in the drip chamber surrounding said outlet flow passage, said valve seat being in the form of an upstanding relatively thin self supporting annulus of a soft rubber-like material, a spike assembly mounted on the drip chamber body and being adapted to be inserted into the permeable stopper of the container to permit liquid to flow from the container into the drip chamber, said drip chamber being capable of receiving liquid from said container and a ball-like float member being capable of floating in said liquid in said drip chamber, said ball-like float member being of a size so that it is capable of



seating within said annulus to a depth so that a major portion is disposed therein for closing off said outlet flow passage when substantially all of the liquid from the drip chamber has passed out of said drip chamber to form an air-tight seal between the ball-like member and said annulus to thereby prevent the flow of air from the drip chamber through the outlet flow passage, said booth having a sufficient length above the annulus when the ball-like float member is disposed in the annulus so that the booth can be squeezed by hand without dislodging the ball-like float member to pump liquid from the source into the drip chamber, said ball-like float member being retained by the annulus after it has seated in said annulus and after liquid has been pumped into the drip chamber to a level above the surface of the ball-like member, said booth being sufficiently compliant so that after the drip chamber has been filed to a desired level, it can be squeezed by hand to dislodge the ball-like float member from the annulus.

4,055,177
HYPODERMIC SYRINGE

Milton J. Cohen, 9201 Persimmon Tree Road, Potomac, Md. 20854

Filed May 28, 1976, Ser. No. 690,846
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—218 M **7 Claims**

1. In a hypodermic syringe for injection of a liquid composition formulated of at least two ingredients, one of which is a liquid phase, to be maintained in a separated relation until admixture with the other ingredients immediately prior to injection, comprising a single unitary elongate tubular member having a bore extending continuously therethrough from an open forward end to an open rearward end of the tubular member, a rupturable sealing disc mounted on the forward end of the tubular member to seal the open forward end, a piston plug within the tubular member dimensioned to extend crosswise of the bore into sealing engagement with the inner walls of the tubular member for axial sliding movement relative thereto as a piston and means for actuating said piston plug for axial movement within the bore, a rupturable sealing member axially slidable within the tubular member and extending cross-

wise of the bore into sealing engagement with the internal walls of the tubular member between the sealing disc and the piston plug to subdivide the bore of the tubular member into forward and rearward chambers separated in sealing relation by the sealing member for receipt of the liquid phase material in the rearward chamber and the other ingredient in the forward chamber, a disc member adjacent the rupturable sealing member dimensioned to extend crosswise of the bore into sealing engagement with the inner walls of the tubular member

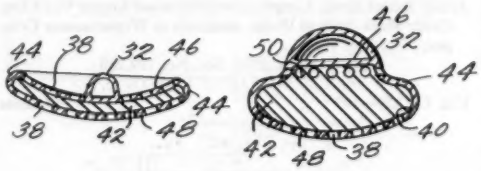
for axial sliding movement relative thereto, and a hollow penetrating needle fixed to said disc member to provide a passage therethrough with the end of the needle extending axially beyond the disc member in the direction towards the sealing member whereby the needle penetrates the sealing member responsive to axial movement to bring the needle into engagement to penetrate the sealing member to enable the liquid phase to flow from the rearward chamber into the forward chamber responsive to axial displacement of the piston plug forwardly in the bore.

4,055,178

DRUG DELIVERY DEVICE FOR PREVENTING CONTACT OF UNDISSOLVED DRUG WITH THE STOMACH LINING

Roy M. Harrigan, Bromley Mountain Road, Manchester, Vt. 05254

Filed Mar. 10, 1976, Ser. No. 665,698
Int. Cl.[2] A61M *31/00*; A61J *1/00*
U.S. Cl. 128—260 **36 Claims**



1. A drug delivery device for use in body cavities containing fluid, said device comprising:

means for containing a drug;

a drug located within said containing means;

means in operative relationship with said drug containing means for enabling entry of said fluid into said containing means and into dissolving contact with said drug and for enabling exit of said fluid and said dissolved drug from said containing means;

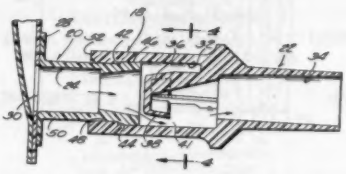
said enabling means being located in the device to substantially prevent physical contact of said drug in undissolved form with the body cavity walls.

4,055,179

VALVE FOR URINARY DRAINAGE CONTAINER OR SIMILAR ARTICLE

James Gordon Manschot, Mukwonago, and Byron L. Mather, Milwaukee, both of Wis., assignors to Plastronics, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 563,490, March 31, 1975, abandoned. This application Mar. 24, 1976, Ser. No. 669,874
Int. Cl.[2] A61F *5/44*
U.S. Cl. 128—275 **16 Claims**



10. The combination of a flexible urinary drainage container and a drainage valve therefor comprising:

a sealed container having a drainage opening in the bottom portion thereof;

a two-piece drainage valve attached to said container for controlling the flow from said container through said drainage opening; said two-piece valve comprising a first tubular member having a flow passageway means therethrough and a tapered valve seat formed in said flow passageway means, and a second tubular member having a flow passageway means therethrough and a valve element fixedly mounted therein on the axis of said second tubular member, said first and second tubular members being telescopically engaged with each other with said first tubular member slidably positioned inside said second tubular member, said valve element of said second tubular member having a tapered valve surface thereon adapted for sealing engagement with said tapered valve seat of said first tubular member when said tubular members are telescoped axially one inside the other, said tapered valve element and said tapered valve seat having self-holding taper angles so that when said valve element is firmly seated in said valve seat the parts will be retained in mating engagement without the need for some type of additional retaining means to hold the parts in closed position, said flow passageway means of said first tubular member including at least one flow passageway positioned adjacent said valve element which will be blocked when said tapered valve surface of said valve element is moved into sealing engagement with said tapered valve seat of said first tubular member and which will be opened to allow flow through the valve when said valve element is moved out of sealing engagement with said valve seat surface; and

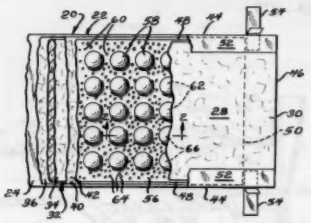
said combination further characterized by having the end of said second tubular member within which said first member is telescopically positioned extending over and engaging the outer surface of said first tubular member so that any tendency of the valve seat to be expanded outwardly due to the wedging action of the parts will be restrained not only by the inherent strength of said first tubular member but also by the reinforcing action of that portion of said second tubular member which fits over the outside surface of said first tubular member.

4,055,180

ABSORBENT ARTICLE WITH RETAINED HYDROCOLLOID MATERIAL

Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,541
Int. Cl.[2] A41B *13/02*; A61F *13/16*
U.S. Cl. 128—287 **31 Claims**



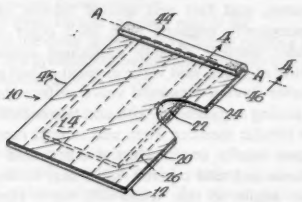
1. An absorbent article comprising, a fluid pervious top sheet, a fluid impervious backing sheet, first and second retaining sheets located intermediate said top and backing sheets and extending substantially between opposed ends of the article, said retaining sheets being attached together in areas and defining a plurality of pockets between said areas and means for permitting passage of body fluids into the pockets, and a hydrocolloid material positioned in said pockets.

4,055,181

TAPE CLOSURE HAVING RELEASE MEANS INTEGRAL WITH DIAPER BACKING SHEET

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 4, 1976, Ser. No. 655,181
Int. Cl.[2] A41B *13/02*
U.S. Cl. 128—287 **4 Claims**



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

a pair of elongated tape segments each having: one face provided with an adhesive coating and a non-tacky opposite face, a fixed end attached to said diaper by means of said adhesive coating at a side marginal location of said outside surface, and a free end, said adhesive coating on said free end being pressure-sensitive, said free end being adapted for folding back so that the non-tacky face of said free end is juxtaposed to the non-tacky face of said fixed end and said adhesive-coated face of the free end faces in the same direction as said diaper outside surface;

said diaper having a transverse margin which is provided with a pair of slits defining a middle segment of said transverse margin and flaps flanking said middle segment, each flap being situated next to one of said tape segments;

release means provided on said flaps on said outside surface of said diaper and adjacent to said fixed end of each tape segment for releasably covering the adhesive-coated face of the folded back free end of each tape segment; and

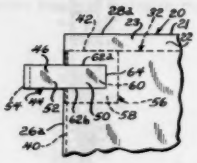
each flap being adapted for folding over said adhesive-coated face of the folded-back free end of said associated tape segment to releasably adhere said adhesive-coated face of each free end to said release means.

4,055,182

DISPOSABLE DIAPER REINFORCEMENT

Robert John Mack, Palatine, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 8, 1975, Ser. No. 620,733
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—287 **21 Claims**



1. A disposable diaper, comprising:

an absorbent pad assembly having an absorbent pad, and a relatively thin sheet of flexible material covering a surface of said pad;

a tape fastener comprising, a pressure-sensitive tape strip having a section secured to an outer surface of said sheet in an area at least partially covering said pad, and a securement portion adapted to extend past a side edge of the pad assembly for securing the diaper about an infant; and

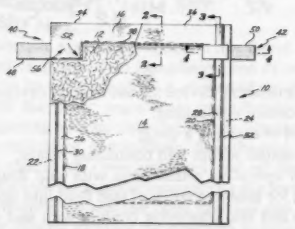
adhesive means directly bonding said sheet to said pad surface in an isolated region overlapping a major portion of the area and extending beyond said area to a location spaced from the area in a direction away from forces normally applied to the strip during placement and use of the diaper, said region including a portion extending substantially the width of said tape section in said area and being sufficiently saturated to reinforce the pad adjacent said surface and minimize tearing of the pad assembly in said region.

4,055,183

DISPOSABLE DIAPER WITH CUTOUT PAD AT TAPE ATTACHMENT AREA

Arthur Sensor Ryan, Longview, and Raymond August Van Vliet, Castle Rock, both of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Oct. 4, 1976, Ser. No. 729,230
Int. Cl.[2] A41B *13/02*; A61F *13/16*
U.S. Cl. 128—287 **8 Claims**



1. A disposable diaper of the type having a generally rectangular shaped absorbent pad disposed between a fluid-permeable cover sheet and a thin plastic backing sheet together with

a pair of pressure-sensitive fastening tapes for securing the diaper about a person has the improvement comprising:

a pair of cutout regions within the absorbent pad positioned at the corners thereof where said tapes are fixedly secured to said backing sheet; and

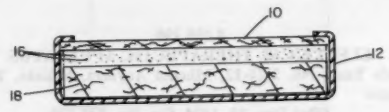
means to bond together the regions of the cover sheet overlaying the backing sheet within the cutout regions into integral tape attaching bases to which a portion of said fastening tapes are attached, whereby tension exerted on the free end of a tape will be transferred, at least in part, to the cover sheet.

4,055,184

ABSORBENT PAD

Hamzeh Karami, Crystal Lake, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed May 10, 1976, Ser. No. 684,544
Int. Cl.² A61F *13/16*
U.S. Cl. 128—287 **7 Claims**



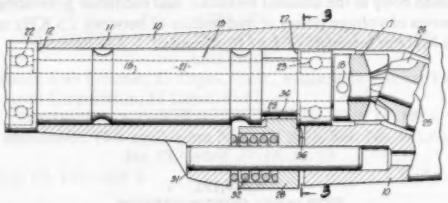
1. An absorbent pad for use in contact with the skin comprising a water pervious facing layer for contacting the skin, a water-impervious backing sheet bonded to the facing layer around its periphery to form a container, and disposed within said container an absorbent mass comprising a solid finely-divided mixture of (1) a completely hydrolyzed starch-polyacrylonitrile graft copolymer in acidic form containing 0.6 to 2 parts by weight of grafted hydrolyzed polyacrylonitrile per part by weight of starch and (2) a non-irritating and non-toxic water-soluble basic material, the relative proportion of base to copolymer being from 1:4 to 1:1 by weight.

4,055,185

ROTARY DRILL FOR SURGEONS

Stephen H. Waldron, Camarillo, Calif., assignor to American Sterilizer Company, Erie, Pa.

Filed Mar. 2, 1976, Ser. No. 663,070
Int. Cl.² A61B *17/00*
U.S. Cl. 128—305.1 **1 Claim**



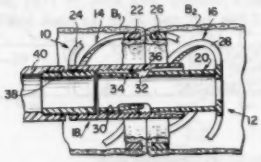
1. In a rotary tool of the type described, the combination of: a manually graspable housing having an open ended socket, a rotary drive gear positioned at the end of the socket remote from the open end thereof, a rotary bur having a cutting element on one end of a shank and having a driven gear on the other end of said shank adapted to mesh with said drive gear, a sleeve encompassing said shank and having axially spaced bearings therein rotatably supporting said shank, said sleeve and bur being removably positioned as a unit in said socket in a position in which the gears are in mesh, said housing having an opening in a side thereof, said sleeve having an annular shoulder adjacent said opening, a latching device for releasably locking said sleeve against removal from said socket, said latching device including a latch mounted on the housing in said opening to turn about an axis parallel to the rotary axis of said bur, said latch being mounted for limited movement along its own axis, resilient means opposing axial movement of said latch in one direction, said latch having a taper surface engageable with said annular shoulder whereby turning of the latch about its axis serves to insure proper meshing of said gears, the latch having an arcuate detent for reception of a portion of said shoulder to hold the latch against turning movement, said resilient means acting to maintain said arcuate detent in contact with said annular shoulder.

4,055,186

ANASTOMOSIS BUTTON

Harry H. Leveen, 800 Poly Place, Brooklyn, N.Y. 11209

Filed Feb. 11, 1976, Ser. No. 657,205
Int. Cl.² A61B *17/04*
U.S. Cl. 128—334 C **6 Claims**



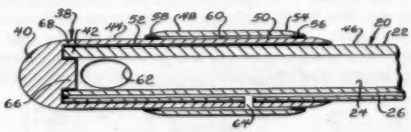
1. A clamping member for axial engagement with a complementary clamping member to form an anastomosis button, said clamping member including a hub and a crown, said hub including axial guiding and engaging means for axially mating and engaging a complementary hub on a said complementary clamping member, and said crown including a clamping collar coaxially positioned about and spaced radially outward of said hub medially located therealong and a plurality of resilient, flexible spring leaves spaced apart and attached at one set of ends thereof to said hub member at intervals thereabout to one side of said clamping collar, said leaves extending radially outward and lengthwise of said hub and said leaves being attached at the other set of ends thereof to said clamping collar at arcuate intervals thereabout.

4,055,187

CATHETER WITH IMPROVED BALLOON ASSEMBLY

Bhupendra C. Patel, Elgin; William J. Binard, Cary, and Daniel M. McWhorter, Arlington Heights, all of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Aug. 5, 1976, Ser. No. 711,948
Int. Cl.² A61M *25/00*
U.S. Cl. 128—349 B **11 Claims**



1. A catheter, comprising:

an elongated shaft having a main lumen and an inflation lumen extending along a wall of the shaft; and

a balloon assembly comprising a tip secured to a distal end of the shaft, a first sleeve extending proximally from the tip and being bonded to an outer surface of the shaft adjacent the distal end thereof, said first sleeve being of one-piece construction with said tip, an expansible second sleeve overlying and being joined to the first sleeve at a first proximal zone extending circumferentially around the

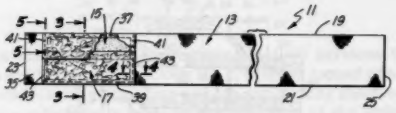
assembly and being joined to the assembly at a second zone extending circumferentially around the assembly at a location spaced distally from said proximal zone to define a fluid receiving cavity intermediate the first and second sleeves, and opening communicating between the main lumen of the shaft and an outer surface of the assembly at a location distal said cavity, and opening means communicating between the cavity and the inflation lumen for inflation of the second sleeve.

4,055,188

THERAPEUTIC WRAP

Robert J. Pelton, Santa Ana, Calif., assignor to Divajex, Santa Ana, Calif.

Filed Feb. 9, 1976, Ser. No. 656,705
Int. Cl.² A61F 7/00, 7/04
U.S. Cl. 128—402 **5 Claims**



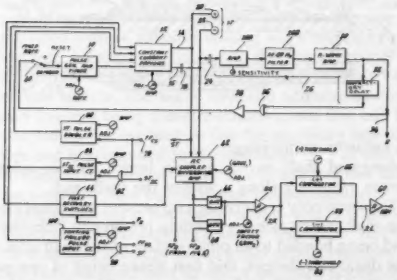
1. A therapeutic wrap comprising:
an elongated flexible bandage, said bandage being resilient in at least one direction and having first and second faces, said bandage being adapted to be wrapped around an injured region to resiliently compressively load the injured region;
a pocket having a front wall, at least a substantial portion of said front wall being defined by means other than said bandage, said bandage being substantially longer than said pocket;
means for attaching the pocket to the bandage with a substantial length of the bandage extending beyond said pocket;
a refrigerant gel package including refrigerant gel and container means for containing the refrigerant gel therein; and
said refrigerant gel package being carried by said pocket whereby the pocket and the refrigerant gel package are both carried by said bandage and said bandage can be wrapped around an injured region to resiliently compressively load the injured region.

4,055,189

CONDITION MONITORING PACER

Albert A. Auerbach, New York, N.Y.; George M. Katz, Leonia, N.J., and Sidney Steinberg, Bronx, N.Y., assignors to Medalert Corporation, New York, N.Y.

Filed May 19, 1975, Ser. No. 578,644
Int. Cl.² A61N 1/36
U.S. Cl. 128—419 PG **27 Claims**



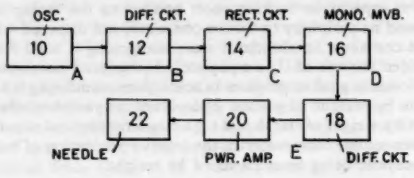
1. A pacer for cardiac stimulation and cardiac condition monitoring comprising a single current path for both stimulation and sensing, generating means coupled to said current path for generating a cardiac stimulation signal, sensing means coupled to said current path for sensing cardiac events, said cardiac events normally including a biphasic cardiac signal properly produced in response to said stimulation signal, said sensing means including means for generating sampling signals coincident with at least a portion of both phases of a biphasic cardiac signal produced in response to said stimulation signal, gating means for producing an output signal in response to said coincidences, and a monitoring means coupled to said gating means and responsive to a lack of coincidence between both said sampling signals and the respective expected phase signals of a normal response biphasic signal indicating an improper condition and providing a warning signal, time displaced from said stimulation signal and thus clinically discernible.

4,055,190

ELECTRICAL THERAPEUTIC APPARATUS

Michio Tany, No. 2-24-12, Minami Aoyama, Minato, Tokyo, Japan

Filed Dec. 19, 1974, Ser. No. 534,430
Int. Cl.² A61N 1/36
U.S. Cl. 128—422 **5 Claims**



1. An electrical therapeutic apparatus which comprises a multi-frequency generating oscillator for generating voltages of predetermined shape over a frequency range including relatively low and relatively high frequencies, means for selecting a voltage of predetermined frequency and wave shape matched to an affected meridian, and conductive needle means for applying the selected voltage at puncture points on the human body at the affected meridian, said oscillator generating a series of voltage pulses at frequencies of between 2.5 KHz to 1.6 MHz at intervals of $\frac{1}{4}$ to 10 seconds.

4,055,191

TOBACCO COMPOSITION

Vello Norman, Raleigh, and Herman G. Bryant, Jr., Durham, both of N.C., assignors to Liggett & Myers Incorporated, Durham, N.C.

Continuation-in-part of Ser. No. 458,355, April 5, 1974, abandoned. This application Oct. 3, 1975, Ser. No. 619,536
Int. Cl.² A24B 15/02, 15/04
U.S. Cl. 131—9 **28 Claims**

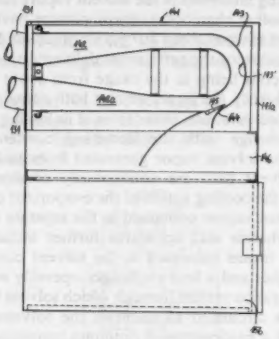
19. A smoking tobacco composition comprising:
a. tobacco, and
b. a catalytic mixture consisting, essentially of palladium, in an amount of from about 0.01 to about 0.1 weight percent based on the weight of the tobacco and a non-toxic inorganic nitrate salt in an amount of from about 0.25 to about 0.75 weight percent calculated as added nitrate nitrogen based on the weight of the tobacco.

4,055,192

RECOVERY OF REUSABLE TOBACCO PARTICLES IN MACHINES FOR THE PRODUCTION OF PLAIN AND FILTER TIPPED SMOKERS PRODUCTS

Herbert Berlin; Siegfried Abrahams, and Peter Brand, all of Hamburg, Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Oct. 16, 1974, Ser. No. 515,440
Claims priority, application Germany, Nov. 28, 1973, 2359193
Int. Cl.[2] A24C *5/18*; A24B *7/14*
U.S. Cl. 131—84 B **13 Claims**



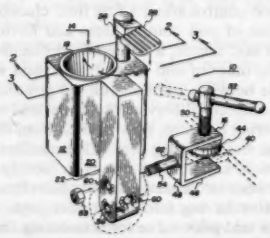
1. In an apparatus for the manufacture and processing of smokers' products wherein wrapped rod-like tobacco fillers are transported by conveyors along at least one predetermined path and/or otherwise manipulated at a plurality of stations, wherein the transport and manipulation of wrapped fillers is effected at least in part by at least one stream of air with attendant unpredictable entry of tobacco particles from the wrapped fillers into the stream, and wherein at least some particles of tobacco are removed from the air stream during passage of the stream through a first segregating means, the improvement which consists in the provision of additional segregating means including at least one separator having means for admitting the air stream ahead of said first segregating means, means for removing at least some tobacco particles from the thus admitted stream, and means for guiding the stream from said separator to said first segregating means.

4,055,193

CIGARETTE SNUFFING ATTACHMENT FOR AN ASHTRAY

James Arlo Lehman, El Cajon, Calif., assignor to Warner-Lehman Corporation, El Cajon, Calif.

Continuation-in-part of Ser. No. 722,708, Sept. 13, 1976, abandoned. This application Nov. 15, 1976, Ser. No. 741,803
Int. Cl.[2] A24F *13/18, 19/14*
U.S. Cl. 131—235 R **6 Claims**



1. A cigarette snuffing attachment for an automobile ashtray having a snuffing eyelet, said attachment comprising:

a. snuffing device having means to extinguish a lighted cigarette;
b. a clamp for clamping an ashtray; and
c. means connecting said clamp to said snuffing device, whereby said snuffing device is attached to an ashtray to insure the complete and safe snuffing of cigarette butts placed therein, said connecting means is angularly adjustable to permit installation of said snuffing device at a selected orientation relative to an ashtray to which said device is attached;
d. said clamp and said snuffing device are connected by a shaft and are rotatable relative to one another on said shaft, and said connecting means includes detents to permit the selection of one of several angular orientations of the snuffing device relative to the clamp about said shaft.

4,055,194

HAIRDRESSER'S STORAGE AND DISPENSER CASE

John Martinez, 3371 W. 30th Ave., Denver, Colo. 80211

Filed June 11, 1976, Ser. No. 695,236
Int. Cl.[2] A45D *2/02*
U.S. Cl. 132—39 **10 Claims**

1. A case for storing and dispensing hair rollers and similar hairdresser's items comprising a base component having upstanding front and back and left and right side walls to provide an open top miscellaneous items storage compartments, guide elements extending from front to back along the oppositely positioned side walls of said base component, a top component of generally hollow type construction having front, back and end walls for disposition in alternate open and closed positions with respect to said base for receiving and holding said hair rollers when the top is in either position, and pivot means interengaging said guide elements and top component for attaching said base and top components together with said pivot means being translationally movable along said guide elements from back to front of said base as the top component is moved pivotally and translationally from back to front as it is moved from an upright open position above said base and at the back of said base compartment to a flat closed position wherein the back wall of said top compartment is in contact with said base for closing off access to said base compartment.

4,055,195

FLUID-RESERVOIR HAIR COMB

Lawrence L. Moses, 1917 Vineyard Ave., Los Angeles, Calif. 90016

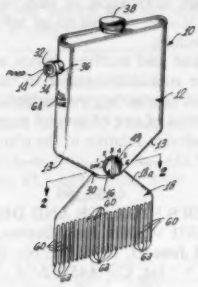
Filed May 7, 1976, Ser. No. 684,367
Int. Cl.[2] A45D *24/22*
U.S. Cl. 132—115 **3 Claims**

1. A fluid-reservoir hair comb comprising:
a fluid reservoir;
means for providing positive pressure within said fluid reservoir;
a comb body;

a plurality of teeth, each having a bore, fluid-connected to said comb body;

a plurality of roller bearings, each of said roller bearings being mounted, for rotational movement only, within an outer end of each of said bores of said teeth; and

an adjustable valve means which in its open position, fluid-



connects said fluid reservoir body to said comb body to provide uniform flow of fluid, from said fluid reservoir, through said valve means, into said comb body and through each of said bores of said teeth to wet said roller bearing and dispense said fluid uniformly to a person's hair, and scalp by means of the rotational movement of said roller bearings.

4,055,196

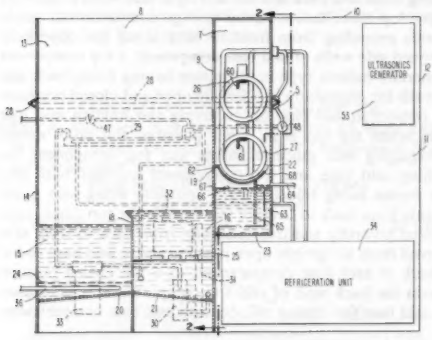
IMMERSION TYPE METAL DEGREASER WITH COMPRESSION-EXPANSION SYSTEM FOR HEATING AND COOLING OF LIQUID SOLVENT AND SOLVENT VAPORS

Thomas J. Kearney, Detroit, Mich., assignor to Detrex Chemical Industries, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 522,609, Nov. 11, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 669,271

Int. Cl.[2] B08B *7/04*

U.S. Cl. 134—107 **5 Claims**



1. Metal degreasing apparatus for cleaning metal work objects first by immersion in a bath of boiling liquid solvent having a boiling point in the range from about 97° to about 120° F. and then by exposure to hot solvent vapors generated from said boiling liquid solvent bath comprising, in combination, a boil chamber constructed to contain said liquid solvent in sufficient amount to enable immersion of metal work objects therein, a rinse chamber constructed to contain a sufficient volume of said liquid solvent to provide a rinsing action on immersion of metal work objects therein and disposed in relation to said boil chamber so that overflow of said liquid solvent from said rinse chamber is directed into the liquid solvent bath contained in said boil chamber, a space overlying said boil chamber and said rinse chamber for containing hot solvent vapors generated through boiling of the liquid solvent contained in said boil chamber, a separate cooling chamber in lateral open communication with the upper level of said hot solvent vapors for condensing said solvent vapors to liquid condensate, means for delivering said liquid condensate to said rinse chamber, a refrigeration system including a refrigerant, a high pressure compressor, condenser coils, and evaporator coils, said condenser coils being totally immersed in the liquid solvent bath contained in said boil chamber and said evaporator coils being immersed in the solvent vapors contained in said separate cooling chamber, said compressor having an operating pressure of from about 207 p.s.i.g. to about 250 p.s.i.g. and the temperature of the refrigerant delivered to said immersed condenser coils being in the range from about 140° to about 200° F., whereby the liquid solvent bath contained in the boil chamber is continuously maintained at its boiling point through heat interchange with the immersed condenser coils and whereby the solvent vapor generated from said continuously boiling solvent bath are continuously condensed to liquid solvent by the cooling action of the evaporator coils immersed in the solvent vapors contained in the separate cooling chamber and wherein said apparatus further includes ultrasonic transducer means immersed in the solvent contained in said rinse chamber and a heat exchanger operably associated with said refrigeration system through which solvent from said rinse chamber is circulated to maintain the solvent in said rinse chamber at a predetermined optimum temperature for operation of said ultrasonic transducers, and means responsive to the temperature of the solvent in said rinse chamber for selectively delivering to said heat exchanger a portion of the hot refrigerant from said condenser or a portion of the cold refrigerant from said evaporator.

4,055,197

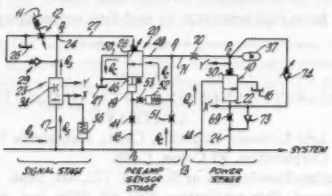
ELECTRO-PROPORTIONAL PRESSURE CONTROL APPARATUS

Robert E. Raymond, Zanesville, Ohio, assignor to De Laval Turbine Inc., Princeton, N.J.

Filed Sept. 10, 1976, Ser. No. 721,936

Int. Cl.[2] G05B *6/05;* **G05D** *16/00*

U.S. Cl. 137—84 **23 Claims**



1. In pressure-control apparatus for connection to and combination with a source of fluid pressure; power-valve means including an inlet port and an outlet port, a valve element having opposed control areas, a first fluid chamber communicating with one of said control areas and having means for connection to said source, a second fluid chamber communicating with the other of said control areas, said valve element being movable between open and closed positions responsive to a pressure-differential between said first and second chambers for delivering a control flow of fluid from the source and via said ports, means biasing said valve member in its valve-closing direction, and control means to modify the pressure difference between said chambers; said control means comprising a pilot valve having inlet and outlet ports, an inlet-port connection for said pilot valve for connecting the same to the source and including a first orifice for drawing a control flow of pressure fluid, said pilot valve including a pilot-valve element with at least one control area, a pilot-valve fluid chamber

communicating with said pilot-valve control area, chamber-connection means for connecting said pilot-valve chamber to the source and including an orifice whereby the pilot-valve chamber senses source pressure via the orifice of said pilot-valve chamber-connection means, a control connection from said pilot-valve inlet port to the second chamber of said power-valve means, means for biasing said pilot-valve member with a force in opposition to pressure in said pilot-valve chamber, and means including a compliant barrier to static flow interconnecting said pilot-valve chamber and said pilot-valve inlet port.

4,055,198

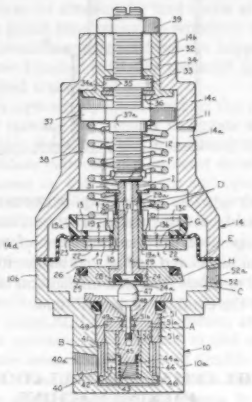
EXCESS PRESSURE RELIEVING VALVE

Frank M. Iannelli, Livingston, N.J., assignor to Tannetics, Inc., Erie, Pa.

Continuation of Ser. No. 497,753, Aug. 15, 1974, abandoned. This application Dec. 12, 1975, Ser. No. 640,077

Int. Cl.² G05D *16/06*

U.S. Cl. 137—116.5 **7 Claims**



6. A safety device for fluid pressure reducing apparatus having a fluid pressure reducing valve, through which fluid passes from a high pressure inlet chamber to a reduced pressure outlet chamber, operable responsive to a compression spring simulating reduced pressure, and a diaphragm interposed between said reduced pressure outlet chamber and said compression spring including:

an elongated threaded element carried for rotation at a predetermined position on a side of said diaphragm opposite said fluid pressure reducing valve;

an abutment bearing on an end of said compression spring remote from said diaphragm carried for axial movement on said elongated threaded element responsive to rotation of said elongated threaded element for setting said reduced pressure;

a valve member carried by said diaphragm having a fluid relief port communicating with said reduced pressure outlet chamber;

a closure member carried below said diaphragm normally in position closing said fluid relief port by seating on the underside of said valve member; and

an operator carried by said closure member in spaced relation with an adjacent end of said elongated threaded element when said closure member is in position closing said fluid relief port which engages said adjacent end of said elongated threaded element restraining said closure member against further movement when said diaphragm and said valve and closure members carried thereby are moved responsive to an excessive pressure in said reduced pressure outlet chamber but permitting further movement of said diaphragm and valve member carried thereby separating said valve member from said movable closure member;

whereby the elongated threaded element acts as a means for setting said reduced pressure and as a stop opening said fluid relief port permitting fluid to escape therethrough relieving excessive pressure in said reduced pressure outlet chamber.

4,055,199

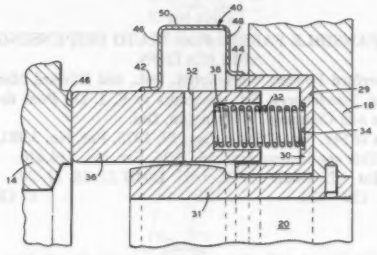
NOZZLE SEAL

Richard Frederick Herman, North Canton, Ohio, assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 3, 1975, Ser. No. 583,488

Int. Cl.² E03B *11/00*

U.S. Cl. 137—590 **5 Claims**



1. A reactor system comprising a pressure vessel having inlet and outlet nozzles, a distribution hoop within said pressure vessel having a fluid passage opening in flow communication with a respective one of said inlet and outlet nozzles, sealing means disposed about said hoop opening and interposed between said hoop and said outlet nozzle to establish a leak-proof connection between said hoop and said nozzle, said sealing means having an annular cup shaped cross section compressing ring, a sealing ring in axial alignment with the compression ring, the sealing ring being slideably engaged within the cup shaped compression ring forming a restricted leakage flow passageway therethrough, a spring operatively disposed between said compression ring and said sealing ring to force the sealing ring into leak tight engagement with the outlet nozzle, and an impervious flexible leak restraining member disposed in space surrounding relation to the compression ring and the sealing ring and circumferentially seal welded thereto to prevent leakage flow through the passageway.

4,055,200

MOISTURE DETECTION APPARATUS

Warren G. Lohoff, 1947 Havenwood Drive, Los Angeles, Calif. 91360

Filed Nov. 17, 1975, Ser. No. 632,451

Int. Cl.² A01G *25/00*

U.S. Cl. 137—624.11 **13 Claims**

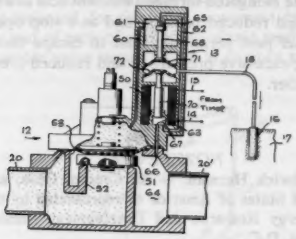
1. A soil moisture detector and actuation apparatus for opening and closing a water supply valve, the combination comprising:

a timer opening said water supply valve for a predetermined period of time;

a soil moisture sensing means comprising a porous air valve buried in the soil adapted to block the passage of air when moist and to conduct the passage of air when dry;

a detector having a pneumatic actuator means whereby a pressure level is maintained or released within a pressure chamber in response to the wet or dry soil condition sensed by said sensing valve; and

release of said pressure level in said pressure chamber of said pneumatic actuator means operable in unison with said



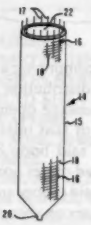
timer during said predetermined period of time to actuate said water supply valve.

4,055,201

EXPANSIBLE FABRIC FOR FLUID DISPENSING APPLICATION

John Rayford Fowler, Wilmington, Del., and Edward Merrick Hogan, Landenberg, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 626,964, Oct. 29, 1975, Pat. No. 3,981,415.
This application Aug. 16, 1976, Ser. No. 714,410
Int. Cl.[2] D03D *15/08, 3/02;* D04B *21/18, 21/20*
U.S. Cl. 139—421 **17 Claims**



1. An expansible fabric suitable for disposition about a fluid-containing expansible member in a dispensing container for providing the force to dispense said fluid from said expansible member and thus from said container, said fabric being expansible by at least 200% and having a unidirectional recovery force to provide the force to dispense said fluid, said fabric comprising elastomer yarn providing said unidirectional recovery force, said recovery force being at least 750 g per cm of fabric width at 100% elongation of said fabric to provide a pressure of at least 0.15 atm, said elastomer yarn being present in said fabric at least 20,000 denier per cm of fabric width in the cross direction to the elastomer yarn, and yarn in engagement with said elastomer yarn to maintain the position of said elastomer yarn in said fabric during its expansion and recovery to prevent blow out of said expansible member between the yarn of said fabric upon the filling of said member with said fluid.

4,055,202

IN-CASE BOTTLE FILLING APPARATUS

James Albert Greene, 455 Tiffany, Richardson, Tex. 75080

Filed June 29, 1976, Ser. No. 700,758
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—59 **12 Claims**

1. A bottle filling apparatus, comprising an elevatable table upon which at least one bottle may be positioned oriented, a fill tank position-mounted over said table; a fill valve means associated with each bottle to be filled, each said fill valve means comprising a fill tube extending downwardly through the bottom of said tank with the longitudinal axis thereof being coextentive with that of the associated bottle to be filled, each said fill tube slideably received through a fixed-mounted securing cup means having an under surface conformingly and pressure sealably engagable with the neck opening of a bottle to be filled; means for selectively elevating said table; means for air evacuating each of said bottles to be filled upon said

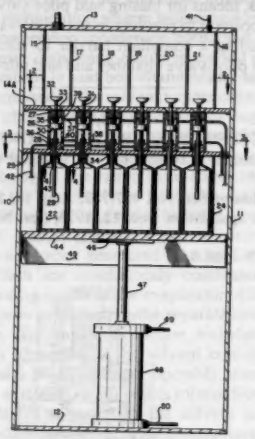


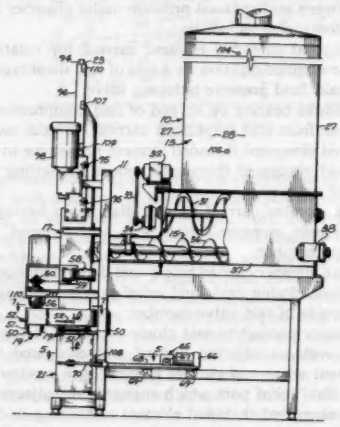
table being elevated for engagement between said securing cup means and said bottles; means for pressurizing said fill tank; and means operable upon engagement of said securing cup means and an associated one of said bottles to activate said fill valve means to effect fluid communication between each said fill tube and the confines of said fill tank.

4,055,203

LOOSE FILL CELLULOSE INSULATION MATERIAL PACKING MACHINE

G. Roger Crawford; Duane Sanders, and David B. Shill, all of Spokane, Wash., assignors to Thermoguard Insulation Co., Spokane, Wash.

Filed Dec. 12, 1975, Ser. No. 640,073
Int. Cl.[2] B30B *15/30;* B65B *1/20*
U.S. Cl. 141—73 **9 Claims**



1. Apparatus for packing low density cellulose fibrous loose fill type building insulation material into flexible containers without forming lumps, comprising:

a supporting framework;

a hopper on the framework adapted to receive a bulk quantity of the cellulose insulation material;

an upright charging tube on the framework for receiving insulation material; said upright charging tube having a downwardly extending open discharge end;

container receiving means on the framework directly below the downwardly extending open discharge end of the charging tube for receiving and supporting an open end of a flexible container in open communication with the downward extending open discharge end of the charging tube;

enclosure means on the framework below the charging tube having a preselected interior shape for releasably encircling the flexible container to form a mold about the flexible container;

a feed screw rotatably mounted within the hopper and in operative communication with the charging tube to withdraw insulation material from the hopper and convey the insulative material to the charging tube;

selectively operable drive means operatively connected to the feed screw for rotating the feed screw at a prescribed speed for a preset time period to withdraw a preselected amount of insulation material from the hopper;

a ribbon screw blender rotatably mounted in the hopper above the feed screw;

a drive means operatively connected to the ribbon screw blender for rotating the blender to agitate the insulation material within the hopper and maintaining the feed screw full of insulation material of a constant density;

compactor means on the framework and operatively connected to the charging tube for pushing the prescribed amount from the charging tube downward into the open flexible container and compressing the insulation material in the flexible container against the encircling enclosure means to form a filled flexible container of compressed insulation material having an exterior shape conforming to the interior shape of the enclosure means; and

control means operatively connected to and operating: (1) said enclosure means to encircle said flexible container on said receiving means; (2) said feed screw drive means and said ribbon screw blender drive means to convey the preselected amount of insulation material from said hopper to said discharge tube; (3) said compactor means to push the preselected amount of insulation material through the discharge end of the discharge tube and compress the insulation material in the flexible container against said enclosure means and; (4) said enclosure means to release the encircled flexible container to enable the container to be removed.

4,055,204

ADJUSTABLE WOBBLE DADO ASSEMBLY HAVING IMPROVED DYNAMIC BALANCE

Fred G. Gunzner, Colton; Dale Edwards, Oregon City, and John A. Lanning, Mulino, all of Oreg., assignors to Lifetime Carbide Company, Colton, Oreg.

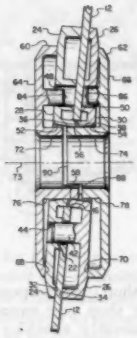
Filed Nov. 22, 1976, Ser. No. 743,686
Int. Cl.² B23C *1/02*
U.S. Cl. 144—238 **4 Claims**

1. An adjustable wobble dado assembly comprising:

a. a plate-like circular blade having two opposite side surfaces, a plurality of cutting teeth spaced around its periphery and means defining an aperture formed axially through its center;

b. a pair of inner plate member, fixedly and centrally mounted on opposite sides of said blade, having generally parallel outer surfaces and complementary inner surfaces inclined with respect to said outer surfaces and in contact with said blade for holding said blade at a position inclined relative to said outer surfaces, each of said inner plate members having means defining a circular bore formed centrally and axially through said inner plate member, each of said bores being tapered so as to have a radius of curvature gradually decreasing in a direction from said outer surface toward said inner surface; and

c. a pair of interconnected outer plate members, having generally parallel outer surfaces and complementary inner surfaces inclined with respect to said outer surfaces of said outer plate members and bearing rotatably against said respective outer surfaces of said inner plate members, each of said outer plate members having means defining an arbor bore formed centrally through said outer plate member along an axis generally normal to the outer surface thereof and a substantially cylindrical hub surrounding said arbor bore and extending centrally from said inner surface of said outer plate member into a respective one of



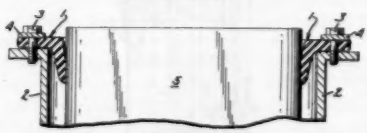
said circular bores along the same axis as said arbor bore. each of said cylindrical hubs having an outside radius of curvature at locations along the length thereof which is smaller than the corresponding radius of curvature at the same location of the circular bore into which the hub extends, the difference between said hub radius of curvature and said circular bore radius of curvature being greater at a location adjacent the outer surface of said inner plate member than at a location adjacent the inner surface of said inner plate member so as to permit tilting of said circular bore with respect to said hub about said location adjacent the inner surface of said inner plate member when said circular bore and hub are rotated relative to one another.

4,055,205

PRESS SEAL

Alfred J. Withoff, and David C. Schultz, both of Grand Rapids, Minn., assignors to Blandin Wood Products, Grand Rapids, Minn.

Filed July 16, 1976, Ser. No. 705,762
Int. Cl.² B27D *3/00*; F02F *5/00*; B30B *1/23*
U.S. Cl. 144—281 R **7 Claims**



5. A hydraulic molding press having a non-circular cylinder or ram powered by a working fluid under pressure, said cylinder being sealed against loss of working fluid with an elastomeric seal having a generally L-shaped cross-section including a support portion and a wiping portion; said support portion having a series of longitudinally spaced perforations for receiving means for clamping said seal in an operation position; said support portion further having longitudinally extending ribs

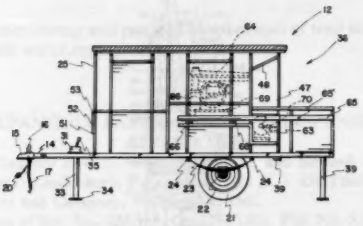
along its inner face embracing said perforations for engaging in a sealed relationship with a supporting structure; said wiping portion and said support portion coming together in a generally perpendicular relationship to form a rounded nose where their outer faces meet; and a reinforcing fabric formed into said seal along its outer surface and extending across the nose of the seal.

4,055,206

COMPOSITE SHOP TRAILER

Carl W. Griffin, 100 Twin Acres, Fayetteville, N.C. 28305

Filed May 14, 1975, Ser. No. 577,355
Int. Cl.[2] B25H *1/12*
U.S. Cl. 144—285 **9 Claims**



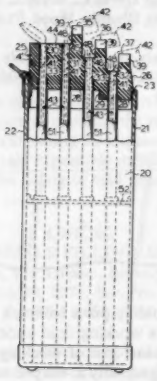
1. A transportable, shop type composite system comprising: an enclosed structure; shop type material processing equipment; means for removably attaching and supporting said equipment within said enclosure; means enabling removal of said equipment from said enclosure while maintaining the attachment of said supporting means by such enclosure; work material support means in the form of a feeder bench so mounted on the exterior of said enclosure as to fold to a vertical position flatly against said exterior during transport and to fold to a generally horizontal position and swing perpendicular to said exterior in its operative position adjacent said equipment when the same is in removed operative position; means for attaching said material support means in aligned position adjacent said removed equipment; and means for transporting said enclosure when said equipment is contained therewithin.

4,055,207

UNITARY CLUB RETAINER FOR GOLF BAGS

Joseph E. Goodwin, 414 W. Fourth, Russellville, Ark. 72801

Filed June 17, 1976, Ser. No. 696,924
Int. Cl.[2] A63B *55/00*
U.S. Cl. 150—1.5 R **4 Claims**



1. A unitary golf bag head **(25)** for suspending playing clubs **(43)** in upright inverted predetermined arrangements, said clubs each having a shaft **(41)** with a blade **(42)** extending laterally from one end thereof, said head comprising:

a body member **(26)** having front and back sides and adapted to fit into the upper open end of said bag;

a plurality of ribs **(35, 36, 37)** integral with and subdividing the upper surface of said member **(26)** into a plurality of alternately spaced surface segment levels **(44, 45, 46)** each extending rearwardly from the base line of the adjacent rib;

said ribs and segment levels each being stepped forwardly and downwardly relative to the head;

said body member **(26)** having a row of passageways **(33)** extending downwardly therethrough from points disposed rearwardly adjacent the base line of each of said stepped levels, to thereby permit said club blades **(42)** to be vertically supported upon the ribs in substantially parallel forwardly projecting positions while the respective club shafts are laterally confined in said passageways, and

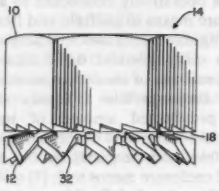
means for releasably attaching said supported blades upon said ribs, wherein said ribs are made of resilient material, and wherein the attaching means for said blades includes V-shaped notches in the upper side of ribs, the angularity between the opposite faces of said blade being less than the angularity between the inner opposed faces of said notches to thereby cause the resilient walls of the notches to laterally clamp the opposite faces of said blade at the notch apices.

4,055,208

LOCKING FASTENER DEVICE

John Joseph Blaul, Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sept. 20, 1976, Ser. No. 724,789
Int. Cl.[2] F16B *39/32*
U.S. Cl. 151—37 **2 Claims**



1. A fastener unit including, in combination, a rotary threaded fastener member having a central axis and a clamping surface extending generally perpendicularly to the axis, the clamping surface including a plurality of ratchet-type cogs spaced circumferentially thereabout, each cog including a camming surface extending at an acute angle in one direction to a plane extending perpendicular to the central axis, a substantially flat abutment surface extending upwardly from the camming surface to said plane and substantially perpendicular thereto, the bottommost edge of each cog extending in a plane substantially perpendicular to the central axis of the fastener, a sheet metal lock washer operatively associated with said clamping surface including an annular body concentric with the axis of the fastener member and a plurality of integral circumferentially spaced teeth, each tooth being twisted from its root to free extremity about an axis extending generally radially from the annular body, the teeth in composite being generally frustoconical in an unstressed state so that initial compressive forces on the unit will axially deflect the inner region of the lock washer downwardly creating a spring force in the unit while bringing the upper edges of each tooth into operative association with the perpendicularly disposed bottom edges of the cogs, the transverse cross-sectional configuration of each tooth, taken across said axis extending radially

from the annular body, including a central region and a pair of side edge marginal regions, each marginal region being formed in opposite directions out of the plane of the central region with the marginal region closest to the clamping surface of the fastener member being formed upwardly toward said clamping surface, so as to extend generally perpendicular to said plane extending perpendicular to the central axis when the washer is in an unstressed condition, said marginal surface adjacent the upper edge being a radially extending tab sheared from the tooth adjacent the root thereof presenting a connection to the remaining portion of the lock washer along a line which is substantially radial thus creating a cantilever spring when engaged by the cogs.

4,055,209

PNEUMATIC RADIAL TIRE TREAD PATTERN

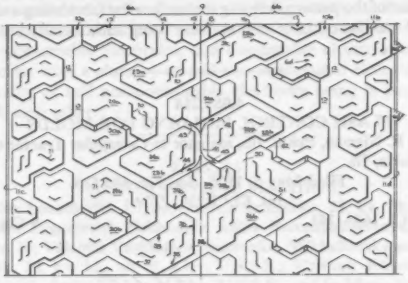
Gerhard Franz-Josef Senger, Aachen, Germany, assignor to Uniroyal Aktiengesellschaft, Aachen, Germany

Filed May 13, 1976, Ser. No. 685,845

Claims priority, application Germany, Sept. 25, 1975, 3139; Nov. 5, 1975, 2549668

Int. Cl.² B60C *11/06, 11/12*

U.S. Cl. 152—209 R **4 Claims**



1. A pneumatic radial tire having an equator comprising:
a carcass including at least one ply having cords disposed substantially radially of the tire;
a reinforcing belt extending substantially circumferentially of the tire over said carcass;
a tread portion, including shoulder portions, of elastometric material over said carcass;
and outer shoulder and sidewall portions of elastomeric material over said carcass, said tread and outer shoulder portions comprising similar circumferentially overlapping patterns, each pattern having lugs and grooves and having a first tread lug at the equator of the tire and having four similar tread lugs of different shape from said first lug, first tread lug has a shape of a polygon having opposite sides parallel and substantially equal in length, wherein said different shape of said four similar tread lugs is a polygon having sides unequal in length, each of said four similar lugs having its longest side substantially parallel to the longest side of said first lug, wherein said four similar tread lugs surround said first tread lug, a first pair of said four similar lugs being adjacent a second lug at the equator in a second of said overlapping patterns and each of said first pair of said four similar lugs having its longest side substantially parallel to the longest side of said second lug, said first pair of said four similar tread lugs separating said first tread lug and said second tread lug along the equator, wherein said second tread lug is of substantially the same shape as said first lug, and a second pair of said four similar lugs being adjacent a third lug at the equator in a third of said overlapping patterns and each of said second pair of said four similar lugs having its longest side substantially parallel to the longest side of said third lug, wherein said first and second pairs of said four similar tread lugs surround said second tread lug, said second pair of said four similar tread lugs separating said second tread lug and said third tread lug along the equator, wherein said third tread lug is of substantially the same shape as said first lug.

4,055,210

ANTI-SKID DEVICE

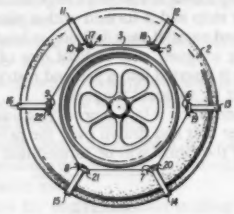
Jacques Mongault, 82 rue Dutot, Paris 15EMe, France

Filed Oct. 1, 1975, Ser. No. 618,385

Claims priority, application France, Oct. 2, 1974, 74.33156

Int. Cl.² B60C *27/02*

U.S. Cl. 152—239 **10 Claims**



1. Anti-skid device for a vehicle wheel comprising:
a plurality of removable and extensible anti-skid straps to be disposed across the road-contacting portion of said wheel,
first and second independent attachment cables, one for each side of the wheel to be equipped,
a plurality of positioning nipples fixed at spaced intervals on the intermediate portion of each of said cables,
stop nipples fastened on the ends of one of said cables,
a safety hook fastened to each of the ends of each of said anti-skid straps, each safety hook of a strap adapted to be connected to a corresponding cable at a positioning nipple thereon, the safety hook at the end of one of said straps adapted to connect the ends of said one cable together by engaging said stop nipples, said safety hook for said end connection also providing mechanical tension for said cable when mounted on said wheel; and
means for connecting the ends of said second cable.

4,055,211

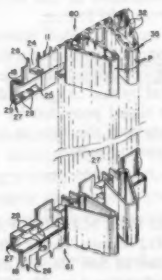
FABRIC HANGING AND PLEATING BRACKET WITH STABILIZING ELEMENTS

Phillip Sperling, 3206 Coolidge Ave., Los Angeles, Calif. 90066

Filed June 7, 1976, Ser. No. 693,368

Int. Cl.² A47H *23/00;* **E05D** *13/02*

U.S. Cl. 160—327 **5 Claims**



1. A fabric hanging and pleating bracket with sectional components, comprising:
a. an elongated holding bar including a lower strip with a bottom edge, an upper strip with a top edge offset out-

wardly and forwardly from the lower strip, and, an intermediate strip linking the lower strip and upper strip;

b. a plurality of prongs extending upwardly from the upper strip top edge for piercing and holding fabric;

c. at least one separable hanger unit removably coupled to and projecting forwardly from the holding bar, the hanger unit having a front wall shaped to assist in forming a fabric pleat and a pair of rearwardly extending shoulder;

d. spikes extending upwardly from a top edge of the hanger unit for piercing and supporting fabric;

e. a plurality of stabilizing means integrally formed at longitudinally spaced intervals with the holding bar — wherein each individual stabilizing means is a flange struck upwardly and forwardly from an edge section of the holding bar lower strip and is formed with a plurality of horizontally aligned parallel gaps defining at least three forwardly projecting tongues, and, at least one of the hanger unit shoulders is inserted into a gap and restrained from lateral movement by adjacent tongues,

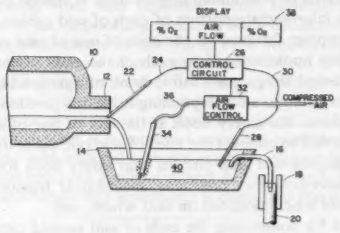
wherein when fabric is laid generally against the holding bar and hanger unit and drawn over the prongs and spikes, a section of the fabric will be formed into a pleat.

4,055,212

CONTROL SYSTEM AND METHOD FOR CONTROLLING THE OXYGEN CONTENT IN CONTINUOUSLY CAST METAL

Ralph A. Vogel, Three Rivers, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Oct. 26, 1976, Ser. No. 735,297
Int. Cl.² B22D *11/10, 11/16*
U.S. Cl. 164—4 **6 Claims**



1. In a continuous casting system for producing an elongated metal rod including a continuous source of molten metal having an oxygen content which is lower than desired, and casting means for continuously withdrawing said molten metal, an automatic system for controlling the oxygen content of the molten metal being withdrawn, comprising:

oxygen content measuring means for providing a signal which is representative of the oxygen content of said molten metal from said source;

oxygen addition means situated intermediate said oxygen content measuring means and said casting means; and

control means for controlling the rate oxygen is added to said molten metal by said oxygen addition means in accordance with the signal provided by said oxygen content measuring means and the rate at which metal is withdrawn by said casting means.

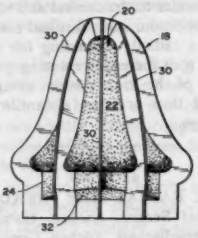
4,055,213

METHOD FOR MAKING PATTERNS

Richard G. Maher, 412 Margo, Tawas City, Mich. 48763

Continuation-in-part of Ser. No. 423,010, Dec. 10, 1973, abandoned. This application Aug. 30, 1976, Ser. No. 718,598
Int. Cl.² B22C *7/00*
U.S. Cl. 164—45 **1 Claim**

1. The method of making a pattern and using said pattern in the fabrication of sand molds at elevated temperatures, comprising first fabricating a first pattern of the desired configuration out of relatively soft material, then forming a shell of plastic material on said first pattern, removing the first pattern from said shell, electroplating nickel to a thickness of at least about 0.100 inch on said shell to form a second pattern, the surface thereof consisting of an inner surface and an outer surface, removing said second pattern from the shell, and then using said second pattern as a pattern in the fabrication of sand molds at elevated temperatures, with one of the inner and outer surface of the pattern defining the surface for fabricating a sand mold and the other of said surfaces being substantially unsupported.

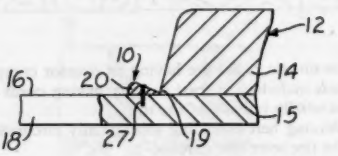


4,055,214

FLASH CONTROL MOLDING FOR MOLDS

John R. Nieman, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 5, 1976, Ser. No. 683,588
Int. Cl.² B22C *7/04*
U.S. Cl. 164—241 **9 Claims**



1. A flash control molding in combination with a pattern having a nonlinear peripheral edge for forming a casting cavity in a mold, comprising:

an elongated strip of material having a preselected and substantially uniform cross sectional configuration throughout its length and defining a relatively thick edge portion and a juxtaposed relatively thin edge portion, said thin edge portion being disposed in abutting relation against said peripheral edge of the pattern with said thick edge portion spaced from the pattern, said elongated strip being separable from the pattern and of a pliable material having physical properties sufficient for shaping thereof conformingly to the nonlinear contour of said peripheral edge of the pattern.

4,055,215

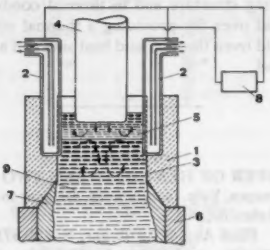
HOT-TOP FOR THE PRODUCTION OF INGOTS USING AN ELECTROSLAG REMELTING PROCESS

Aldo Ramacciotti, and Eugenio Repetto, both of Rome, Italy, assignors to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed July 14, 1976, Ser. No. 705,263
Claims priority, application Italy, July 23, 1975, 50628/75
Int. Cl.² B22D *27/02*
U.S. Cl. 164—252 **8 Claims**

1. A hot-top for the production of ingots obtained at least in

part by an electroslag remelting process, the hot-top being made of refractory material and having on its inner surface a plurality of non-consumable elongated electrodes partially embedded in said refractory material, said electrodes having exposed parts constituting a plurality of elongated vertical parallel electrically conducting zones that extend from the upper edge of the hot-top downwardly, a consumable electrode having its lower end disposed axially within said hot-top and spaced from the inner side walls of the hot-top, and means for passing an electric current between said consumable and non-consumable electrodes, said consumable electrode being in series with a plurality of said non-consumable electrode, a plurality of said non-consumable electrodes being in parallel with each other.



4,055,216

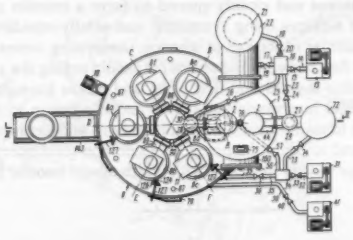
VACUUM CASTING MACHINE

Viktor Leonidovich Ulyanov, ulitsa Semashko, 21, kv. 78; Eduard Evgenievich Shishkarev, ulitsa Bereznyakovskaya, 24, kv. 10; Valentin Vasilievich Nazarenko, Mikhailovsky pereulok, 20, kv. 12,, all of, Kiev, U.S.S.R.; Vladimir Efimovich Yavich, deceased, late of Kiev, U.S.S.R., and by Maria Semenovna Yavich, administrator, ulitsa Serova, 33, kv. 20, Kiev, U.S.S.R.

Continuation of Ser. No. 664,076, March 5, 1976, abandoned, which is a continuation of Ser. No. 542,703, Jan. 21, 1975, abandoned. This application Oct. 28, 1976, Ser. No. 736,360

Int. Cl.[2] B22D *27/16, 13/00*

U.S. Cl. 164—258 **6 Claims**



1. A vacuum casting machine comprising

a melting chamber with an opening for pouring metal;

a vessel for melting metal disposed in said melting chamber;

heaters for melting metal disposed in said melting chamber;

a first vacuum seal closing said opening for pouring metal;

a plurality of casting molds for receiving the melted metal;

a plurality of mold chambers each having one casting mold disposed therein, each mold chamber having a mold chamber opening for pouring the metal into its casting mold;

a plurality of second vacuum seals, each of said mold chambers having one of said second vacuum seals for closing the mold chamber opening for pouring the metal into its casting mold;

a rotary table accommodating around its circumference said plurality of mold chambers with associated molds;

a self-contained drive of said rotary table operatively associated with said rotary table, said rotary table serving the purpose of registering, in turning, each of the mold chamber openings for pouring metal in said mold chambers containing the molds with said opening for pouring metal in said melting chamber;

a vacuum sealing means serving to couple said first vacuum seal with each of said second vacuum seals in a vacuum-tight fashion during the process of pouring the metal into said casting molds;

a system for evacuating said melting chamber and associated mold chamber with mold;

an additional vacuum system disposed away from said rotary table for evacuating said mold chambers prior to connection with said melting chamber;

a sealed rotatable connecting means for connecting said additional vacuum system to all of said mold chambers on said rotary table, and

a support means for supporting said melting chamber and said rotary table.

4,055,217

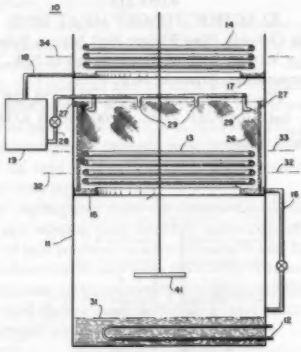
METHOD FOR MAINTAINING A VAPOR BLANKET IN A CONDENSATION HEATING FACILITY

Tze Yao Chu, Lawrence Township, Mercer County, and George Michael Wenger, Franklin Township, Somerset County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,242

Int. Cl.[2] F28D *15/00*

U.S. Cl. 165—1 **2 Claims**



1. A method for maintaining a body of secondary vapor in a condensation heating facility having a vessel, open to the atmosphere, containing a body of hot primary vapor with the body of secondary vapor interposed between the body of primary vapor and the atmosphere, the method comprising the steps of:

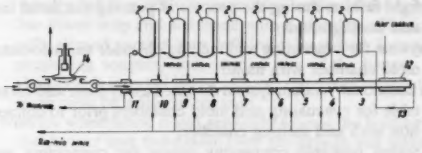
depositing a secondary liquid on a wick mounted within the vessel, and

wicking the secondary liquid through the secondary body of vapor and into contact with the body of hot primary vapor to vaporize the secondary liquid to provide supplemental secondary vapor to maintain the body of secondary vapor.

4,055,218
METHOD AND ARRANGEMENT FOR CHANGING THE TEMPERATURE OF FLUIDS WHICH FORM INCRUSTATIONS

Fritz Kampf, and Hans-Georg Kaltenberg, both of Lunen, Germany, assignors to Vereinigte Aluminum-Werke Aktiengesellschaft, Bonn, Germany

Continuation-in-part of Ser. No. 222,757, Feb. 2, 1972, abandoned. This application Aug. 23, 1974, Ser. No. 500,123
Claims priority, application Germany, Feb. 10, 1971, 2106198
Int. Cl.[2] F28F *13/06, 13/14;* **B01D** *1/28, 1/00*
U.S. Cl. 165—1 **10 Claims**



1. A method of effecting a temperature change of fluids which form incrustations, comprising the steps of:

conveying a fluid medium to undergo temperature change along a predetermined path;

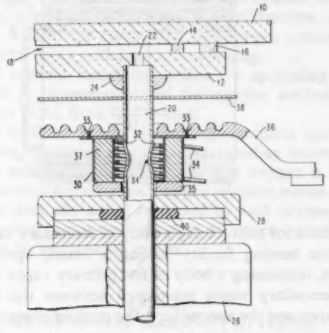
changing the temperature of said fluid medium along a first segment of said path which is maintained substantially at a first temperature at which said fluid medium forms incrustations at a first rate, said first segment having a first length; and

changing the temperature of said fluid medium along a second segment of said path which is maintained substantially at a second temperature at which said fluid medium forms incrustations at a second rate, selecting a predetermined second length for said second segment such that the ratio of said first length and said second length is substantially equal to the ratio of said first rate and said second rate.

4,055,219
ELECTRIC TIP-OFF HEAT SINK

John Victor Orlandi, Pine Plains; Neil Myron Poley, and Donald Miller Wilson, both of Kingston, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed June 17, 1974, Ser. No. 479,720
Int. Cl.[2] F28F *7/00, 13/00;* **H05B** *3/58*
U.S. Cl. 219—390 **2 Claims**



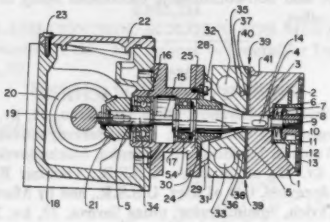
1. For use during the course of fabricating a gas panel, wherein as part of said fabrication process a partly completed gas panel is placed in a vacuum oven for a bake out, backfill and sealing and wherein a glass tubular member inserted into said gas panel is used for evacuating gaseous contaminants from said gas panel and thereafter is sealed by means of an oven which encircles said member, said oven having a heater coil element and a relatively thin supporting structure that is in part located between the heater element and the gas panel, apparatus for protecting said gas panel from thermal damage by heat radiated from said oven comprising:

a separate heat sink mounted on the part of the oven supporting structure that is located between the heater coil element and the gas panel between said oven and said gas panel said heat sink being relatively thicker than said oven supporting structure and in thermal conductive contact with said oven for providing a thermal conductive path from said oven through said heat sink and away from said gas panel.

4,055,220
TRANSFER OF HEAT BETWEEN TWO BODIES

Willem Stelwagen, Velp, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Aug. 3, 1970, Ser. No. 60,371
Claims priority, application Netherlands, Aug. 7, 1969, 6912025
The portion of the term of this patent subsequent to Oct. 25, 1993, has been disclaimed.
Int. Cl.[2] F28D *11/02;* **F28F** *5/02*
U.S. Cl. 165—89 **7 Claims**



1. An apparatus for transfer of heat between a first body and a yarn transport roller mounted on a driving shaft rotatably connected to said first body, said first body and yarn transport roller being variably movable relative to each other, said first body and yarn transport roller having co-operating transfer surfaces adjacent and closely spaced to form a transfer gap, said transfer surfaces being symmetric and axially equidistant and perpendicular to the axis of rotation, comprising means for heating said first body, spring means for axially urging the yarn transport roller toward said first body, and means for supplying a non-solid interspacial substance under pressure to said transfer gap to transfer heat from said body to said yarn transport roller and to cause the pressure of said non-solid interspacial substance to vary inversely with width of said transfer gap.

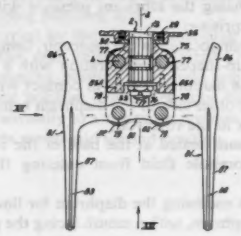
4,055,221
SOIL CULTIVATING IMPLEMENTS

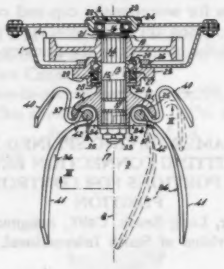
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed July 17, 1975, Ser. No. 596,825
Claims priority, application Netherlands, July 18, 1974, 7409706
Int. Cl.[2] A01B *33/06, 33/10, 33/14*
U.S. Cl. 172—47 **17 Claims**

1. A soil-cultivating implement comprising a frame and at least one soil-working member being supported by said frame, said member being rotatable about an upwardly extending axis of rotation, driving means connected to said member to rotate same, tine means mounted on a support of said soil-working member, said tine means being strip-shaped and comprising

two operative, soil-contacting ends, said tine means being connected to said support by elongated pin means and the





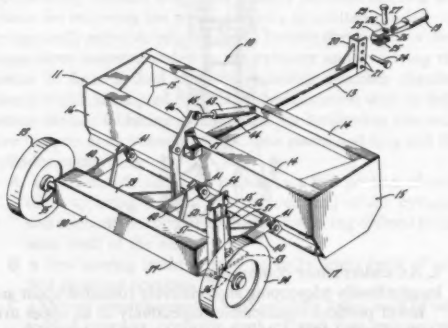
latter extending substantially horizontally and perpendicular to said axis of rotation.

4,055,222

EARTH MOVING IMPLEMENT WITH ADJUSTABLE WHEEL ASSEMBLY

Donald J. Runte, 1220 Hillcrest Drive, Freeport, Ill. 61032

Filed Apr. 29, 1976, Ser. No. 681,390
Int. Cl.[2] E02F *3/64*
U.S. Cl. 172—413 **3 Claims**



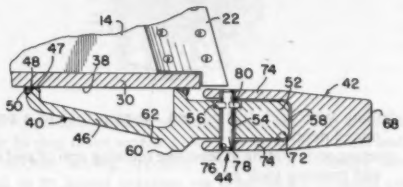
1. An earth mover adapted to be towed in a forward direction and comprising a bucket having laterally spaced upright side walls and having a scraping blade extending between the lower rear portions of said side walls, means attached to and projecting forwardly from said bucket for connecting the latter to a towing vehicle, a wheel assembly comprising a support and a pair of laterally spaced ground-engaging wheels attached to said support, means mounting said support for up and down pivoting on the rear of said bucket and about a transversely extending axis, a reversible hydraulic actuator connected between said bucket and said support and operable when operated in opposite directions to wing said support and said wheels upwardly and downwardly in unison relative to said bucket and about said axis and thereby effect lowering and raising of said scraper blade with respect to the ground, means mounting one of said wheels for up and down linear movement relative to said support and said other wheel, and a second reversible hydraulic actuator connected between said support and said one wheel and operable when operated in opposite directions to shift said one wheel upwardly and downwardly relative to said support and said other wheel and thereby effect tilting of the bucket about a fore-and-aft extending axis.

4,055,223

CORNER TOOTH ASSEMBLY FOR AN EARTHMOVING IMPLEMENT HAVING A HOLLOW REARWARD PORTION

Thomas P. Casey, Burlington, Iowa; Howard A. Hansen, Mossville; Gene R. Klett, Joliet, and James A. Olthoff, South Holland, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 563,862, March 31, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,326
Int. Cl.[2] E02F *3/60, 3/76*
U.S. Cl. 172—777 **3 Claims**



1. A corner tooth assembly, for an earthmoving implement having a predetermined forward and rearward direction of travel and having an upright sidewall disposed in a plane substantially aligned with said directions of travel and including an outer surface, comprising:

a corner tooth adapter having a hollow rear portion of laterally inwardly extending C-shaped cross section, said rear portion tapering rearwardly and convergingly towards said sidewall and defining a substantially continuous peripheral edge which is secured to a lower forward portion of said outer surface of said sidewall by a weld, and a convergingly tapered nose portion extending forwardly of said sidewall in laterally outwardly spaced relation thereto; and

a socketed replaceable wear tip mounted on said nose portion of said adapter fully laterally outwardly of said outer surface of said sidewall to a location sufficient for working forces subjected on said wear tip during forward travel of the implement to be transmitted rearwardly through said adapter and thence directed solely to said outer surface of said sidewall through said weld.

4,055,224

METHOD FOR FORMING AN UNDERGROUND CAVITY

Richard A. Wallers, 111 Amethyst Ave., Balboa Island, Calif. 92662

Filed July 1, 1975, Ser. No. 592,169
Int. Cl.[2] E21B *7/12*
U.S. Cl. 175—5 **12 Claims**

1. A method for placing an offshore caisson comprising:

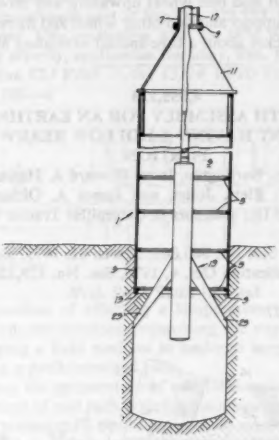
connecting at least one conductor section to said caisson, said conductor having a cross-sectional area less than the cross-sectional area of said caisson;

lowering said caisson and said conductor section to a predetermined position on the underwater floor;

positioning a drill stem having a combined drilling and

reaming tool attached thereto within said conductor section and said caisson;

reverse-circulating a drilling mud through the annular space between said connected conductor section and caisson and said drill stem, said drilling mud returning through said drill stem;



drilling with said drilling and reaming tool to a predetermined depth;

opening and rotating at least one reaming arm of said drilling and reaming tool; and

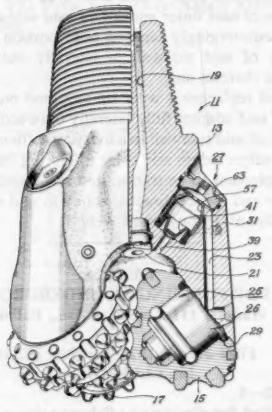
positioning said caisson within the area drilled and reamed by said drilling and reaming tool.

4,055,225

LUBRICANT PRESSURE COMPENSATOR FOR AN EARTH BORING DRILL BIT

Stuart C. Millsapps, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed May 17, 1976, Ser. No. 687,131
Int. Cl.[2] E21B 9/10
U.S. Cl. 175—228 **10 Claims**



1. In an earth boring drill bit of the type having rotatable cutters mounted on depending head sections that define a shroud on the underside of the bit between the head sections, lubricant passages for supplying lubricant to the cutters, a lubricant reservoir having a base and walls, and a passage for the admission of borehole fluids extending from the base of the lubricant reservoir to the shroud, an improved lubricant compensator for equalizing the lubricant pressure with the borehole pressure comprising:

a flexible diaphram located in the reservoir, being expansible to define a cup-shaped configuration with a closed end, one side of the diaphram being in contact with the borehole fluid, the other side of the diaphram being in contact with lubricant in the reservoir;

primary seal means seated at the base of the reservoir for preventing borehole fluid from entering the lubricant reservoir;

protector means enclosing the diaphram for limiting expansion of the diaphram, with a mouth facing the primary seal means;

a closed cap bearing against the end of the protector means that is opposite the mouth and sealing the top of the reservoir from borehole fluids; and

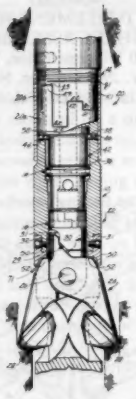
retaining means for securing the cap and compressing the primary seal means, thereby providing a seal from borehole fluids at the interface of the primary seal means and the base.

4,055,226

UNDERREAMER HAVING SPLINED TORQUE TRANSMITTING CONNECTION BETWEEN TELESCOPING PORTIONS FOR CONTROL OF CUTTER POSITION

Robert W. Weber, Long Beach, Calif., assignor to The Servco Company, a division of Smith International, Inc., Gardena, Calif.

Continuation of Ser. No. 668,412, March 19, 1976, abandoned. This application Oct. 27, 1976, Ser. No. 736,109
Int. Cl.[2] E21B 9/26
U.S. Cl. 175—273 **20 Claims**



1. An underreamer comprising:

longitudinally telescoping and relatively rotatable upper and lower portions connectable respectively to an upper drill string and a lower drill string;

first and second connector parts, one carried by each said telescoping portion, each said connector part comprising a plurality of grooves of staggered length and a plurality of keys of staggered length, the grooves and keys of one connector part being engageable and disengageable with, respectively, the keys and grooves of the other connector part, said connector parts having first and second engaged positions, both positions for transmitting torque between the telescoping portions, said connector parts providing a different angular position and a different longitudinal position for the telescoping portions in each said engaged position;

a plurality of cutter arms;

means for pivotally mounting the cutter arms on one of said telescoping portions; and

means carried by the other telescoping portion for urging the cutter arms relatively outward towards an extended underreaming position when said connector parts are in said first position, the cutter arms being retracted relatively inwardly to a clearance position when said connector parts are in said second position.

4,055,227

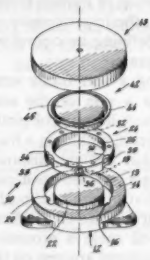
HEAVY DUTY HYDRAULIC WEIGHING APPARATUS

George E. Brackett, Nashua, N.H., assignor to The A. H. Emery Company, New Canaan, Conn.

Continuation-in-part of Ser. No. 619,395, Oct. 3, 1975, abandoned. This application May 6, 1976, Ser. No. 683,897

Int. Cl.² G01G 5/04

U.S. Cl. 177—208 **3 Claims**



1. In a hydraulic weighing apparatus which includes a piston, an annular ring fixed with and encircling the piston, a cooperating cylinder which fits radially between the ring and piston for receiving the piston in freely interfittable, relatively reciprocally movable relation, and a flexible diaphragm of fluid impervious material sealed in the cylinder and overlying the piston to form a fluid pressure receiving chamber therebetween which is adapted for fluid communication with an indicating device; a bearing arrangement for facilitating free relative reciprocal movement between the piston and ring and the cylinder comprising:

A. a plurality of cylindrical raceways, a first portion of each raceway being defined in the outer wall of the cylinder and a second portion of each raceway being defined in the inner wall of the ring;

B. a first bearing insert at least partially lining each of said first raceway portions;

C. a second bearing insert at least partially lining each of said second raceway portions; each of said first and second bearing inserts comprising a hardened, arcuate strip having an angular dimension less than the angular dimension of said raceway portion which said insert lines, said insert being recessed into said raceway portion and having two opposing edges extending substantially parallel to the axis about which said strip is arcuate, said raceway portion circumferentially extending beyond and abutting said opposing insert edges to form webs that firmly lock said insert therein;

D. ball bearing means disposed in each raceway; and

E. means for positioning each ball bearing means to contact said first and second bearing inserts in each raceway.

4,055,228

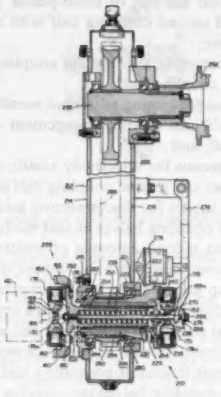
DRIVE LINE DISCONNECT MECHANISM

Donald E. Holmes, Clark Lake; Wayne R. Howard; John F. Fisher, and Burton S. Zeller, all of Jackson, all of Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed May 24, 1976, Ser. No. 689,226

Int. Cl.² B60D 1/00

U.S. Cl. 180—14 B **18 Claims**



1. In a modular vehicle which is separable into a powder module having drive means as well as drivable wheels and a work module having drivable wheels, said modules being adapted to be joined together via confronting opposed coupling members attached to said power and work modules, respectively, a drive line disconnect mechanism comprising:

a. a first toothed coupling half rotatably mounted in a midmount bearing box attached to said power module coupling member, with one end of said first coupling half being adapted to be drivably connected with said power module drive means; and

b. a second toothed coupling half rotatably and pivotally mounted in a disconnect assembly attached to said work module coupling member, said disconnect assembly including:

1. a support housing attached to said work module coupling member and having a through bore;

2. an output shaft member extending through said support housing bore and rotatably journalled therein, said output shaft member having a central bore, with one end of said output shaft member merging into opposed radially outwardly extending first flange portions, said output shaft member also including transfer means for drivably connecting said output shaft member with further transfer means adapted to be operatively connected with the drivable wheels of said work module;

3. a transfer shaft member, coaxial with said output shaft member and having a longitudially splined bore closed on one end, extends into the bore of said output shaft member, with an open end of said transfer shaft member merging into opposed radially outwardly extending second flange portions adjacent to said first flange portions, said second flange portions being connected with said first flange portions via a first universal joint assembly, thereby permitting a limited amount of multi-planar pivotal movement of said transfer shaft member with respect to said output shaft member;

4. an input member, coaxial with said transfer shaft member, has an externally splined bore portion thereof extending into and intermeshing with the splined bore of said transfer shaft member thus forming a driving and axially slidable interconnection therebetween, with one end of said input member merging into opposed radially

outwardly extending third flange portions that are axiallly spaced from one end of said output shaft member;

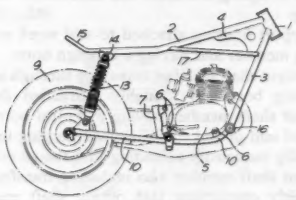
5. said second toothed coupling half being coaxial with said input member and having opposed radially inwardly extending fourth flange portions adjacent to said third flange portions, said fourth flange portions being connected with said third flange portions via a second universal joint assembly thereby permitting a limited second amount of multi-planar pivotal movement of said second coupling half with respect to said input member;
6. means for centering said second coupling half relative to said first coupling half;
7. biasing means for biasing said input member and second coupling half into driving engagement with said first coupling half; and
8. disconnect means for selectively axially displacing said input member and second coupling half in opposition to said biasing means for disconnecting said first and second toothed coupling halves as said modules are joined, said first and second amounts of multi-planar pivotal movement combining with said means for centering so as to take up unavoidable misalignments between said vehicle modules as said modules are coupled so as to permit initial alignment of said first and second toothed coupling halves, with subsequent actuation of said disconnect means thereafter permitting said biasing means to bias said coupling halves into driving engagement.

4,055,229

FRAMES FOR MOTORCYCLES

James Henry Richard Lindsay, 108, Lower Churchtown Road, Dublin 14, Ireland

Filed Feb. 20, 1976, Ser. No. 660,023
Claims priority, application Ireland, Feb. 20, 1975, 347/75
Int. Cl.[2] B60K *15/00*
U.S. Cl. 180—32 **2 Claims**



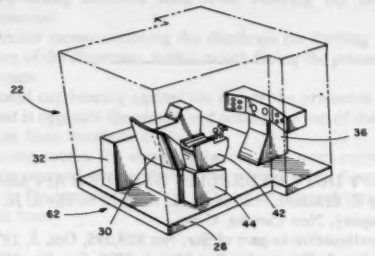
1. A trials motorcycle for use in off-the-road motorcycle sports having a frame comprising a top frame member, a saddle support mounted at the rearward end of said top frame member, an upwardly inclined front frame member connected at an upper end thereof to the forward end of said upper frame member, and a steering head mounted on said connecting ends of said top and front frame members; a forked swinging arm pivotally connected by pivot means at a forward end thereof to the lower end of said front frame member, said forked swinging arm extending rearwardly from the motorcycle frame, a rear wheel carried between the rear ends of the fork of said swinging arm, shock absorbing means connecting said rear ends of said swinging arm and top frame members, an engine mounted on said swinging arm forwardly of said saddle support and directly behind said front frame member and said pivot means, and a drive chain connected between power output means on the engine and said rear wheel.

4,055,230

VEHICLE CONTROL ARMREST IN A VIBRATION ISOLATED CONTROL MODULE

Anthony M. Kestian, Berwyn, and Raymond J. Allori, Chicago, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Continuation-in-part of Ser. No. 432,799, Jan. 11, 1974, abandoned. This application Apr. 25, 1975, Ser. No. 571,442
Int. Cl.[2] B62D *33/06*
U.S. Cl. 180—89.1 **2 Claims**



1. In a tractor vehicle having a main frame, an engine means, traction wheels, steerable wheels, and a drive line means providing for the transmission of motion from said engine means to said traction wheels, the improvement comprising:

a modular control defining an operator's station mounted above said main frame;

a vehicle seat having a seat frame structure, including a podium affixed to a side of the seat frame structure, mounted to said modular control platform;

a pivotal control armrest, including a frame structure, pivotally mounted to said podium, disposed adjacent to said vehicle seat having a shielded push-pull cable mounted to the armrest frame structure, the push-pull cable passing from the control armrest to the podium where the shielding of the push-pull cable is grounded whereby pivotal movement of the control armrest on the podium results in push-pull cable adjustment to provide a vehicle control function;

a control stick for operating said tractor vehicle through a plurality of flexible control cables, the control stick pivotally mounted to the armrest frame structure;

an instrument console disposed adjacent to said seat opposite said pivotal control armrest and mounted to said modular control platform;

an instrument pod mounted to said modular control platform in front of said vehicle seat having an array of instruments for monitoring said tractor vehicle;

a plurality of resiliently deformable mounting pads positioned between said modular control platform and said main frame whereby said modular control platform is isolated from shock and vibration of said main frame through the use of said resiliently deformable mounting pads and said flexible cables.

4,055,231

SILENCER FOR INTERNAL COMBUSTION ENGINES

Ginez Martinez, 153, rue Anatole France, 93130 Noisy le Sec, France

Filed Oct. 14, 1975, Ser. No. 622,116
Claims priority, application France, Oct. 14, 1974, 74.35358; Oct. 8, 1975, 75.30835
Int. Cl.[2] F01N *1/08, 7/18, 3/06*
U.S. Cl. 181—241 **6 Claims**

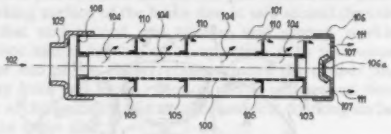
1. A silencer for an internal combustion engine, comprising:

a supple resilient internal tube, adapted to vibrate longitudinally under the influence of the exhaust gas and permeable to said gas, receiving the exhaust gas from said engine;

an elastic external sheath which is substantially not supple

and not adapted to vibrate longitudinally and substantially not permeable to the gas, said sheath being substantially coaxial with the internal tube;

an end piece closing the internal tube at the end opposite to the inlet of the exhaust gas therein;

washers or spacers slideably secured to the internal tube at irregular intervals and permitting the gas to pass in the

annular space comprised between the washers or spacers and the external sheath;

an end piece secured to the end of the external sheath opposite to the inlet of the gas and provided with apertures for the output of the exhaust gas; and

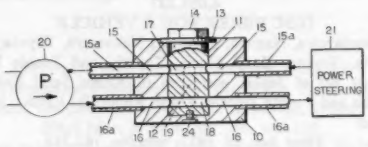
an expansion chamber between the end piece closing the internal tube and the end piece secured to the end of the external sheath.

4,055,232

POWER STEERING REGULATION FOR AUTOMOBILES

Walter A. Moore, 121 Mixer St., Adrian, Mich. 49221

Filed Oct. 20, 1976, Ser. No. 734,177
Int. Cl.[2] B62D *5/08*
U.S. Cl. 180—132 **1 Claim**



1. A hydraulic pressure control for use in a power-assisted steering system of a motor vehicle including a source of hydraulic pressure comprising

a. a valve body interposed between said source of hydraulic pressure and said steering system and having an inlet passageway communicating with said hydraulic pressure source and said steering system for delivering pressure fluid to the latter,

b. an outlet passageway in said valve body parallel to said inlet passageway and also communicating with said steering system and said pressure source to enable return fluid flow to said source,

c. a rotary plug valve in said valve body provided with parallel ducts adapted to align respectively with said inlet and outlet passageways, and a channel adapted to connect portions of said inlet and outlet passageways on the hydraulic pressure source side, thereby to enable unrestricted fluid flow and afford relatively easy steering operation,

d. said valve being shiftable for selectively restricting or stopping the hydraulic flow therethrough for reducing the sensitivity and ease by which steering is accomplished, or rendering said power-assisted steering system ineffective,

e. means on said valve on the outside of said valve body affording manual operating means for said valve, thereby to predetermine the resistance imposed on the steering effort of the operator,

f. indicia means on said last means and valve body for visually indicating the adjusted position of the valve, and

g. set screw means for securely holding said valve in position of adjustment.

4,055,233

EAR COUPLER

Charles B. Huntress, Orange, Calif., assignor to Electronic Engineering Co. of California, Santa Ana, Calif.

Filed Dec. 22, 1975, Ser. No. 643,571
Int. Cl.[2] A61B *7/02*
U.S. Cl. 181—135 **11 Claims**

1. A self-forming ear coupler for acoustic control comprising:

a. a conical portion, having an orifice therethrough, for entering the ear,

b. only one soft flexible flange having a shallow conical shape extending outwardly and rearwardly from said conical portion, the external surface of said conical portion and said flange flaring smoothly outwardly to provide a smooth transitional shape therebetween, said flange having a circumferential bead of round cross-section at the outer periphery thereof, the radial extent of said flange being sufficient to effectively seal the external portion of the ear from said conical portion orifice, and

c. a mounting portion on the side of said flange opposite to said conical portion, said mounting portion having an orifice extending from the orifice of said conical portion to provide a continuous passage through said ear coupler,

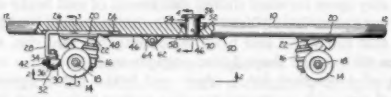
the recited structure being proportioned to significantly deform said flexible flange when it is placed in the ear, whereby said flange acts as an ear plug sealing the ear against ambient sounds.

4,055,234

SKATEBOARD WITH BRAKE

Elwin E. Burton, 6530 SE. 89th Ave., Portland, Oreg. 97266

Filed July 29, 1976, Ser. No. 709,726
Int. Cl.[2] B60T *1/04*
U.S. Cl. 188—2 R **2 Claims**



1. A skateboard comprising

a. an elongated rigid body member having forward and rearward ends and also having top and bottom surfaces,

b. wheel assemblies on the bottom of said body member adjacent each end,

c. each of said wheel assemblies having a pair of wheels,

d. a slide member mounted on the bottom side of said body member for longitudinal adjustable movement,

e. a cross frame support,

f. brake shoe means on said cross frame support adjacent to said wheels,

g. a single vertically disposed pivot means connecting said cross frame support to said slide member whereby said cross frame support and said brake shoe means can pivot with side turning of the wheels,

h. an upright brake pedal extending through said body member and having an upper foot engaging portion,

i. and link means operative by said brake pedal providing

longitudinal movement of said slide member to engage the brake shoes against the wheels upon a brake actuating movement of said brake pedal.

4,055,235

BICYCLE BRAKE DEVICE WITH INCREASED BRAKING POWER

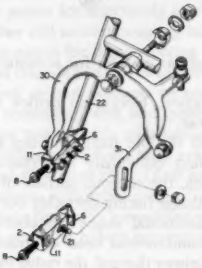
Hiroshi Tanaka, Kawasaki; Noriyuki Ogisu, Tokyo, and Akira Urakawa, Yamato, all of Japan, assignors to Nichibei Fuji Cycle Co., Ltd., Tokyo, Japan

Filed July 8, 1976, Ser. No. 703,588

Claims priority, application Japan, Nov. 21, 1975, 50-157405[U]

Int. Cl.[2] B62L *1/12*

U.S. Cl. 188—24 **3 Claims**



1. A bicycle brake device having increased braking power to be applied to the wheel rim of a bicycle, comprising a pair of caliper type brake arms mounted to the seat stay bridge of the seat stay of a bicycle body by an attaching bolt for pivotal movement of said arms about said bolt so that the ends thereof are movable toward and away from said bicycle wheel rim for applying braking pressure to said rim, a cage mounted on the ends of said caliper arms by a brake shoe pin and nut, said cage being open at one end thereof and closed at the other end thereof, a brake shoe slidably carried for axial movement in said cage through said open end thereof, said brake shoe having a front end and a rear end oriented with said open end and closed end respectively of said cage, the forward rotation of said wheel being in a direction from said rear end of said brake shoe toward said front end thereof, a brake block carried in said brake shoe having a surface for engaging said rim to apply friction forces thereto for braking action, a wedge shaped cam mounted at said front end of said brake shoe for engaging said seat stay upon forward sliding movement of said brake shoe in said cage as a result of friction forces between said brake block and said rim when said brake block engages said rim, so that when said wedge shaped cam engages said seat stay a component of a reaction force urges said brake block against the wheel rim with increased pressing power to increase braking power, a threaded bolt projecting from said rear end of said brake shoe and protruding through an opening in said closed end of said cage, and a spring coiled about said bolt between said cage and means on said bike for returning said brake shoe to its initial position after said cam has engaged said seat stay.

4,055,236

DISC BRAKE WITH AN ANNULAR METAL FRAME HOLDING PART-CIRCULAR PADS

Frederick Sidney Dowell, Coventry, England, assignor to Dunlop Limited, London, England

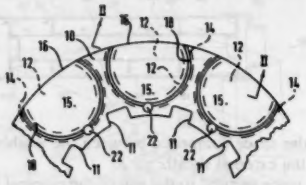
Filed May 3, 1976, Ser. No. 682,768

Claims priority, application United Kingdom, May 10, 1975, 19755/75

Int. Cl.[2] F16D *65/12*

U.S. Cl. 188—73.2 **12 Claims**

1. A brake disc comprising an annular metal frame having means defining a plurality of circumferentially distributed channels of segmented-circular shape, each having a gap corresponding to a chord of the circle, each said gap opening radially of the frame, and a plurality of friction members of a material more brittle and of higher specific heat than the frame, each member being shaped at least approximately as a segmented circle and fitting into an associated one of the channels by insertion through the gap and being subsequently rotated while in the channel; the width of the member on a diametral



line disecting its chordal edge being less than the width of the gap of the associated channel whereby the member can be inserted in or removed from the channel through the gap when the chordal edge of the member extend radially of the frame; releasable means for preventing rotation of the member after being positioned in its associated channel so that when the member is in an operative position with its chordal edge extending generally circumferentially of the frame it is held in place.

4,055,237

DISC BRAKE FOR A VEHICLE

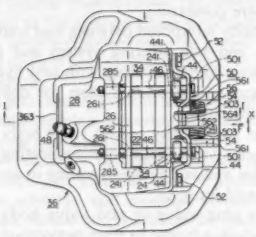
Akio Numazawa, Nagoya; Hiroyuki Nakamura, Toyota; Tokio Kurita, Toyota; Kouji Horie, Toyota, and Toshio Kondo, Chiryu, all of Japan, assignors to Aishin Seiki Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, both of, Japan

Filed Jan. 25, 1977, Ser. No. 762,343

Claims priority, application Japan, Jan. 27, 1976, 51-7818

Int. Cl.[2] F16D *55/228*

U.S. Cl. 188—73.4 **3 Claims**



1. A disc brake for a vehicle comprising:

a stationary member integral with a body of the vehicle;

a first and a second friction pad of plate like shape parallely arranged along a first direction transverse to a wheel axis, each pad being movably mounted to said stationary member in a second direction parallel to the wheel axis;

a brake disc having a first and a second working surface parallely arranged along said first direction, said brake disc being secured to said wheel axis so that the disc rotates in accordance with the rotation of the wheel axis, and said brake disk being arranged between said first and second friction pads so that the first working surface faces the first pad while the second working surface faces the second pad;

a caliper plate loosely fitted to the stationary member so that it is positioned to be parallel to said second direction, said

caliper plate being arranged around the friction pads and has a first and a second inner end facing each other in said second direction, said first inner end being situated adjacent to said first friction pad;

a hydraulic mechanism arranged in the stationary member so that it is located between said second friction pad and said second inner end of the caliper plate, which hydraulic mechanism is capable of co-operating with said second friction pad to move said second pad toward said second working surface of the brake disc in said second direction so that said second pad touches said second working surface and is capable of co-operating with said second inner end of the caliper plate to move the caliper plate away from said second friction pad in said second direction so that said first pad touches said first working surface of the brake disc;

a pair of spaced apart arms formed integral with the stationary member in cantilever fashion along said second direction so that the first and the second friction pads are situated between said arms, the arms operating to receive brake torque generated between the friction pads and the brake disc in a circumferential direction of the disc when said hydraulic mechanism is operated to brake the vehicle;

a bridge member arranged between free ends of said arms, and;

resilient means disposed between said bridge member and said caliper plate so that they are resiliently separated from each other in one direction transverse to the caliper plate and so that the caliper plate is resiliently held against movement thereof in another direction parallel to the caliper plate,

whereby rattling of the caliper plate, due to said loose fitting of the caliper plate to the stationary member, is prevented while the vehicle is moving.

4,055,238

ANTI-SQUEAL DEVICE IN DISC BRAKE

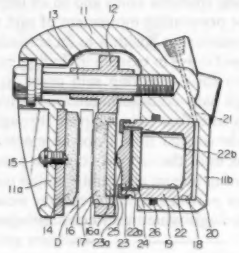
Tetsuo Haraikawa, Funabashi, and Hiroshi Ito, Yokohama, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Mar. 3, 1976, Ser. No. 663,228

Claims priority, application Japan, Mar. 3, 1975, 50-25731

Int. Cl.[2] F16D *65/00*

U.S. Cl. 188—73.5 **1 Claim**



1. In a disc brake having a piston, a rotatable disc, and a friction pad having a back plate and urged against one surface of the rotatable disc by said piston, the improvement comprising a plate having a partially spherical projection on one surface thereof abutting the back plate of the friction pad, said piston having a stepped bore therein with a large diameter bore portion facing said back plate and a small diameter bore portion and a shoulder therebetween, said plate being in said large diameter bore portion and a predetermined clearance being left around the circumference of said plate between the large diameter bore portion and the outer circumference of the plate for permitting relative lateral movement between said plate and said large diameter bore portion, a generally flat spacer in said large diameter bore portion having one surface abutting said shoulder and the other surface being substantially flat and opposed to the other surface of said plate for transmitting thrust from the piston to substantially the entire surface of said plate and thence through said plate to said friction pad, a predetermined clearance being left around the circumference of said spacer and said large diameter bore portion for permitting relative lateral movement between said spacer and said large diameter bore portion, and a lubricant between the spacer and the plate.

4,055,239

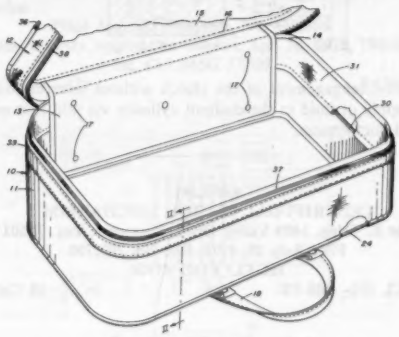
LUGGAGE CASE

Jay H. Weiner, New Castle, Pa., assignor to Airway Industries, Inc., Ellwood City, Pa.

Filed Feb. 13, 1976, Ser. No. 657,956

Int. Cl.[2] A45C *13/36*

U.S. Cl. 190—50 **3 Claims**



1. A luggage case of the lightweight semi-rigid type, comprising a main body portion of substantially rectangular shape having a first spring steel support wire loop secured at the outside corner thereof, a mating cover portion, hinged to the body portion, and having a second spring steel support wire loop secured at the outside corner thereof, a peripheral flap member attached interiorly along one edge to the inner periphery of the main body portion and swingable exteriorly to a position outside the main body portion, and a third substantially rectangular spring steel support wire secured to the peripheral flap member and swung to a position in the interior of said main body portion intermediate between and parallel to the said first and said second support wire loops.

4,055,240

FLUID OPERATED TOOTHED CLUTCH WITH DASHPOT

Herbert Arthur Clements, Weybridge, and Robert Howard Heybourne, East Molesey, both of England, assignors to S.S.S. Patents Limited, London, England

Filed Jan. 19, 1976, Ser. No. 650,462

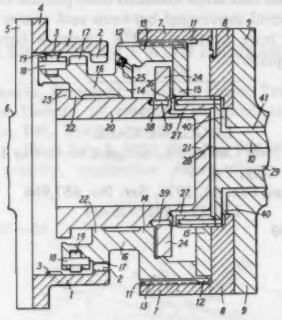
Claims priority, application United Kingdom, Jan. 21, 1975, 2622/75

Int. Cl.[2] F16D *23/02*

U.S. Cl. 192—67 A **1 Claim**

1. A toothed clutch of the self-engaging type that includes a hydraulic dashpot comprising a dashpot cylinder and a piston movable therein, for cushioning the final phase of clutch engagement, and duct system via which fluid under pressure can be fed to the dashpot cylinder whereby in the disengaged condition of the clutch to provide cushioning fluid in the dashpot cylinder on one side of the piston and in the engaged condition of the clutch to establish in the dashpot cyliner on the other side of the piston a holding pressure that resists clutch self-disengagement, the invention compising a duct system which is independent of said first-mentioned duct system and via which in the engaged condition of the clutch fluid under pressure can be fed when required to the dashpot cylin-

der on the said one side of the piston to establish a fluid pressure that opposes said holding pressure whereby to facilitate



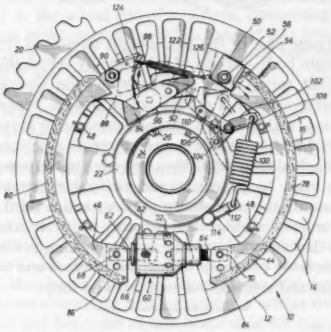
the self-disengagement of the clutch without interruption of the supply of fluid to the dashpot cylinder via said first-mentioned duct system.

4,055,241

CENTRIFUGAL CLUTCH MECHANISM

Dwight E. Tripp, 1409 Valley Drive, Longview, Tex. 75601

Filed July 29, 1976, Ser. No. 709,790
Int. Cl.[2] F16D *43/06*
U.S. Cl. 192—105 CE **18 Claims**



1. A centrifugal clutch mechanism for mechanical transfer of energy from a rotatable drive source to a rotatable driven element, said clutch mechanism comprising:

a rotor element adapted to be directly rotated by said drive source;

a power shoe being movably supported by said rotor element and being rotatable therewith;

adjustable drive means being fixed to said rotor element and releasably engaging said power shoe and imparting a preselected force vector from said rotor element to said power shoe;

an energizing shoe also being movably supported by said rotor element and being rotatable with said rotor element, said energizing shoe being in spaced opposed relation with said power shoe;

adjustable positioning means engaging opposed extremities of said power shoe and said energizing shoe and maintaining a predetermined spacing therebetween;

a shoe movement control means being movably supported for rotation along with said rotor element, said movement control means being movable by centrifugal force as said rotor element rotates, said shoe movement control means imparting expansion movement to said energizing shoe responsive to movement of said movement control means;

adjustable means retarding movement of said shoe movement control means; and

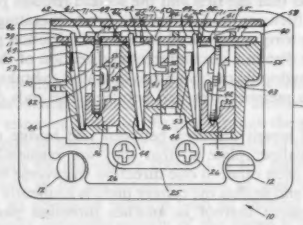
clutch housing means to which said rotatable driven element is nonrotatably connected, said clutch housing means defining a cylindrical internal clutch surface for engagement by said power shoe and energizing shoe.

4,055,242

TANDEM-COIN SLIDE APPARATUS

John C. Mellinger, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed July 9, 1976, Ser. No. 703,928
Int. Cl.[2] G07F *5/08*
U.S. Cl. 194—55 **9 Claims**



1. A coin slide apparatus for initiating the operation of a machine with a predetermined combination of coins supported on edge comprising: slide support means for mounting said coin slide apparatus to said machine including a faceplate and a slide housing defining a coin slide guideway extending through said faceplate; coin receiver means supported in said slide housing and defining a plurality of coin slots for receiving and supporting said coins in a substantially vertical orientation and, upon manual actuation, for moving said coins from a coin receiving position to a coin measuring position, at least two of said coin slots being longitudinally aligned for supporting coins in tandem; means for authenticating individual coins and responsive to individual spurious coins and to an improper combination of coins for preventing movement of said slide assembly from said coin measuring position to an actuating position; means for moving said coins in tandem including means on said coin receiver means for contacting said coins to push them sequentially through said coin authenticating means and for retaining in escrow the first coin to pass through said coin authenticating means so that it will not be ejected from said coin receiver means until the second coin has passed through said coin authenticating means; and coin ejecting means including at least one open port in said coin receiver means at a coin ejecting position through which said coins are ejected.

4,055,243

COIN OPERATED TIMER

Glenn C. Brand, Star Rte., Box 28C, Marcell, Minn. 56657

Filed July 26, 1976, Ser. No. 708,738
Int. Cl.[2] G07F *5/04*
U.S. Cl. 194—61 **18 Claims**

1. A coin controlled apparatus, comprising:

a frame;

a central shaft passing through said frame;

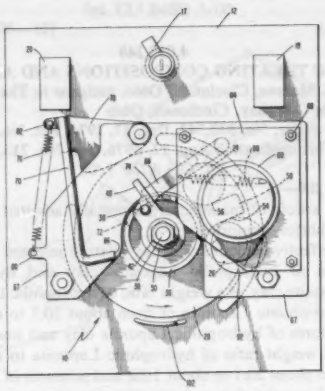
a coin-carrying disk coupled to said central shaft and rotatable therewith, said disk containing at least one circumferentially located receiving slot;

detent means attached to said disk, said detent means including at least a first detent;

engagement means mounted to said frame member and pivotable between first and second positions, said engagement means being engageable with said detent in only the

first position, said disk being locked against rotation during engagement;

clutch means for coupling said shaft to said disk, slippage therebetween being thereby provided when greater than a



predetermined amount of torque is applied between said shaft and said disk; and

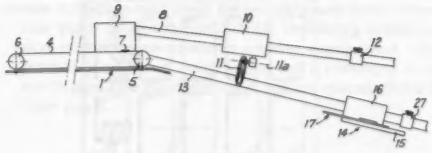
cam means for guiding said engagement means into said first position for engagement with said detent in an absence of a coin located in said slot.

4,055,244

APPARATUS FOR INTRODUCING FABRIC ARTICLE PARTS TO AN ASSEMBLING MACHINE

Jean-Pierre A. Raisin, and André R. Bernardot, both of Troyes, France, assignors to Centre Technique Industriel dit Institut Textile de France, France

Filed Sept. 21, 1976, Ser. No. 725,275
Claims priority, application France, Oct. 3, 1975, 75.30399
Int. Cl.[2] B23Q *7/04*
U.S. Cl. 198—345 **8 Claims**



1. In an installation for transferring article parts to an automatic assembling machine,

suspension means movable between a rear position and an advanced position along a first guide path and comprising first holding means for supporting the article parts between their front and rear ends,

a guide carriage movable between a rear and forward position along a second guide path substantially parallel to the first path, and

second holding means for engaging the rear ends of the article parts,

control circuit means,

first actuating means connected to the control circuit means for opening the first holding means when the suspension means is in its forward position,

second actuating means connected to the

control circuit means for opening the second holding means when the guide carriage is in its forward position,

an introduction slide assembly for receiving article parts to be assembled, each article part being provided with retaining members along the respective edges, and

means for entraining the article parts along the slide assembly,

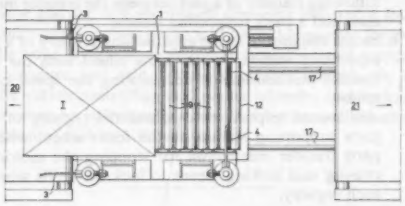
the said suspension means and the said carriage being movable along their respective guide paths to their forward positions for which the holding means are located at the intake to the slide assembly, under the action of said entrainment means at the time of the introduction to the slide assembly of article parts held by said holding means.

4,055,245

DEVICE WITH COLLECTING BASKET FOR COLLECTING PRINTED MATTER IN A PILE AND DISCHARGING THE SAME

Leif Sundberg, Eksjo, Sweden, assignor to Wamac AB, Eksjo, Sweden

Filed Apr. 12, 1976, Ser. No. 676,356
Claims priority, application Sweden, Apr. 16, 1975, 7504369
Int. Cl.[2] B65G *57/00*
U.S. Cl. 198—422 **9 Claims**



1. A device with a collecting basket for collecting printed matter, particularly newspapers, in the form of a pile and for discharging the pile through a lateral opening in the collecting basket, the bottom of said collecting basket comprising a freely movable conveyor having its direction of conveying movement aligned with the lateral opening in the basket, said device being characterized in that: said basket includes two mechanically controlled outwardly movable swing gates adjacent said lateral opening for selectively closing said opening and means connected to said gates for selective opening and closing of said gates; a laterally reciprocable sled means; means mounting said basket on said sled means for reciprocation therewith; power means connected to said sled means to reciprocate said sled means and basket laterally in a direction aligned with the direction of free movement of the basket bottom conveyor from a starting position, where said basket is positioned with the swing gates closed for collecting the printed matter, through a relatively short distance to a stop position and in which stop position the said swing gates are in an open condition; and a horizontal conveyor located with its input adjacent said stop position at substantially the same level as said basket bottom conveyor, so that a pile of printed matter, carried by said basket during lateral reciprocation of the sled means from the start position to the stop position, will by its own inertia move along the basket bottom conveyor out through the lateral opening and over onto the horizontal conveyor.

4,055,246

FERRIS WHEEL TYPE PARTS WASHER

Norman G. Zalewski, Southgate, Mich., assignor to Taylor & Gaskin, Detroit, Mich.

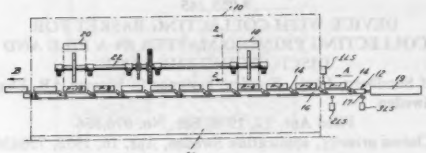
Filed Feb. 11, 1976, Ser. No. 657,240
Int. Cl.[2] B65G *47/00*
U.S. Cl. 198—575 **6 Claims**

1. In an industrial parts washer of the ferris wheel type:

a ferris wheel having a plurality of circumaxially spaced apart parts supporting stations;

parts transfer mechanism for delivering parts to and receiv-

ing parts from successive stations of the ferris wheel when a station is in registry with the transfer mechanism;
a bull gear connected to the ferris wheel to rotate the same;
a spur gear in meshing engagement with the bull gear;
a rotary fluid pressure motor connected to the spur gear;
locking means for locking the ferris wheel against rotation when successive stations are in registry with the transfer mechanism;
and mechanism for controlling said motor and said locking means through a cycle of operation comprising;
a. means for initiating operation of said locking means to



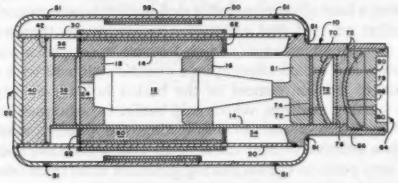
release the ferris wheel and for starting said motor following transfer of a part between the transfer mechanism and a parts supporting station;
b. means responsive to the approaching registry of a parts supporting station on the ferris wheel with the parts transfer mechanism for decelerating the speed of the motor;
c. and means responsive to substantial registry of such parts supporting station on the ferris wheel with the parts transfer mechanism for stopping the motor and causing said locking means to lock the ferris wheel in such registry.

4,055,247

EXPLOSION CONTAINMENT DEVICE

William B. Benedick, and Charles J. Daniel, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 22, 1976, Ser. No. 734,834
Int. Cl.[2] F42B *37/02*
U.S. Cl. 206—3 **6 Claims**



1. An explosive shipping container for absorbing the explosion energy and containing the products of an explosive disposed therein, said container comprising:
an inner layer of steel forming a cylindrical essentially gastight innermost chamber;
means for supporting said explosive within said chamber;
intermediate and outer layers of steel spaced from said inner layer and from each other substantially enclosing said innermost chamber;
filler comprising distended and crushable material disposed about said chamber between said inner and intermediate steel layers; and
a plurality of cold rolled stainless steel strips spaced from and encircling said explosive to enclose the area of maximum expected shrapnel density, wherein at least one of said steel strips is disposed between said inner and intermediate steel layers adjacent to said intermediate steel layer, said container being sufficiently strong to fully contain the explosion effects of an explosive disposed in said innermost chamber.

4,055,248

FABRIC TREATING COMPOSITIONS AND ARTICLES

Mario S. Marsan, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 533,742, Dec. 17, 1974, Pat. No. 3,989,631.
This application Aug. 12, 1976, Ser. No. 713,935
Int. Cl.[2] A23F *1/08*
U.S. Cl. 206—.5 **9 Claims**

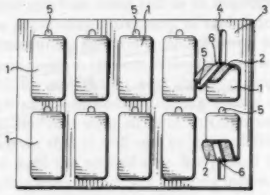
1. An article of manufacture especially adapted for conditioning fabrics, comprising:
a. an effective amount of a clay mixture selected from: mixtures of hydrophilic Laponite clay and hydrophobic Laponite clay, at a weight ratio of hydrophilic Laponite to hydrophobic Laponite of from about 20:1 to about 1:20; mixtures of hydrophilic Laponite clay and smectite clay, at a weight ratio of hydrophilic Laponite to smectite of from about 20:1 to about 1:20; and mixtures of hydrophobic Laponite clay and smectite clay at a weight ratio of hydrophobic Laponite clay of from about 20:1 to about 1:20; said clay mixture being in releasable combination with;
b. a water-insoluble dispensing means.

4,055,249

STICKER PACKAGE

Shirou Kojima, 14-3, 1-chome, Nishishinjuku, Shinjuku, Tokyo, Japan

Filed Mar. 19, 1973, Ser. No. 342,362
Claims priority, application Japan, Mar. 17, 1972, 47-27132
Int. Cl.[2] B65D *85/70*
U.S. Cl. 206—447 **4 Claims**



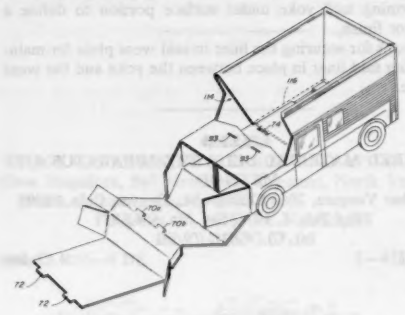
1. A sticker unit, comprising;
a plurality of sticking sheets disposed as a series in contact with one another longitudinally of the series and having sticker parting lines disposed transversely of the series between the sticking sheets;
a layer of pressure sensitive adhesive on a surface of the series of sticking sheets; and
a release sheet temporarily stuck on said layer of adhesive, said release sheet extending along and substantially coextensive with said series of sticking sheets and having parting lines defining release sheet portions, each portion comprising a part underlying a limited part of a respective sticking sheet and a lug at an end of said part, said lug underlying an adjacent sticking sheet;
thereby facilitating stripping successive sticking sheets of said series from the release sheet and also facilitating subsequent stripping of each sticking sheet from any surface whereon it is stuck.

4,055,250

FOLDING BLANK, VEHICLE SIMULATING DISPLAY

Theron T. Mayhew, Emporia, Kans., assignor to Hopkins Manufacturing Corporation, Emporia, Kans.

Filed July 21, 1976, Ser. No. 707,306
Int. Cl.[2] B65D *5/00*
U.S. Cl. 206—457 17 Claims



1. A blank foldable to form a vehicle simulating display comprising,

a generally rectangular floor panel,

a front panel group foldably secured to a first edge of said floor panel,

a pair of side panel groups each foldably secured to second and third edges of said floor panel, each side panel group including inner and outer side wall panels,

a rear panel group foldably secured to a fourth edge of said floor panel opposite said first edge including inner and outer rear wall panels,

said front, side and rear panels groups being foldable towards said floor panel to a vehicle simulating position in which said inner and outer rear wall panels are each generally perpendicular to said floor panel and together with said floor panel from a generally rectangular open-top container, and the inner wall panel and the outer wall panel of each side and rear panel group are in a mutually parallel relationship, and

means formed in said blank for securing said front, side and rear panel groups in said vehicle simulating folded position including tab means in locking engagement with a portion of said front panel group and a portion of at least one of said side panel groups at a point spaced above said floor panel.

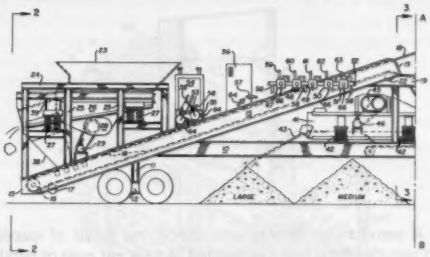
4,055,251

PORTABLE BLAST FURNACE SLAG BENEFICIATING PLANT

James L. Pieton, Girard, Ohio, assignor to McEsco Inc., McDonald, Ohio

Filed Dec. 8, 1975, Ser. No. 638,354
Int. Cl.[2] B03C *1/30*
U.S. Cl. 209—38 5 Claims

1. In a portable slag beneficiating plant for processing steel mill slag and separating metallic pieces therefrom and classifying the metallic pieces as to particle size, a frame, a feed hopper on said frame, support springs on said frame, an inclined grizzly on said support springs and positioned beneath said feed hopper, an eccentric device attached to said inclined grizzly for oscillating the same, a magnetic separating roll and a conveyor belt extending from beneath said inclined grizzly to and trained over said magnetic separating roll and arranged to drive the same, second support springs on said frame, a second grizzly on said second support spring and positioned beneath said magnetic separating roll, a second eccentric device attached to said second grizzly for oscillating the same, said second grizzly arranged to receive metallic pieces from said magnetic separating roll and a second belt conveyor extending from beneath a portion of said second grizzly to a point adjacent one end of said frame, a source of fluid pressure, a hydraulic motor connected to said first mentioned eccentric device for actuating the same, a second hydraulic motor connected to said eccentric device for actuating the same, a third hydraulic motor connected to said magnetic separating roll for driving



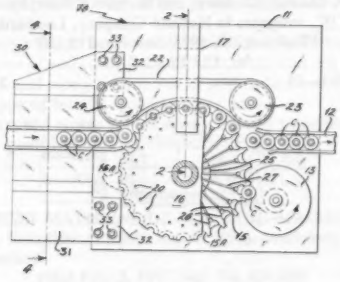
the same and the first mentioned conveyor belt and a fourth hydraulic motor connected to said second conveyor for moving the same, hydraulic piping interconnecting said source of fluid pressure and said hydraulic motors individually and throttle valves controlling said piping whereby said hydraulic motors may be individually controlled by the individual manipulation of said throttle valves.

4,055,252

CONTAINER LIQUID LEVEL DETECTOR APPARATUS

Robert L. Klamm, St. Charles, and Maurice R. Day, Florissant, both of Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

Filed Mar. 25, 1976, Ser. No. 670,157
Int. Cl.[2] B07C *5/344*
U.S. Cl. 209—74 M 18 Claims



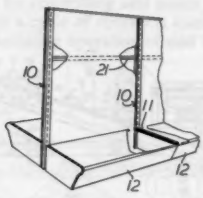
1. In a container contents detector means for determining the presence of contents in a non-metallic container, first means generating a microwaave beam, means moving a container across the microwave beam for determining the presence of contents therein, a second means spaced from said first means and detecting the microwave beam pasing through the container, said first and second means being out of touching relation with the containers, means responsive to the reception of the microwave beam by said second means to generate a signal indicative of the presence of a container and the contents in the container, and means establishing a predetermined reference value for comparison with said signal generated by said second means representative of the presence of a container and its contents.

4,055,253

MERCHANDISE DISPLAY UNIT

Muammer A. Oztekin, P.O. Box 6247A, Birmingham, Ala. 35217

Filed July 21, 1976, Ser. No. 707,231
Int. Cl.[2] A47B 9/14
U.S. Cl. 211—189 **5 Claims**



1. A merchandise display unit embodying a pair of spaced apart uprights detachably connected to adjacent ends of parallel, spaced apart shoe members which extend generally perpendicular to at least one upstanding side plate with the outer end of each said shoe member terminating adjacent one end of said side plate, the improvement comprising:

a. adjacent parallel plates defining a shoe member with each of the plates having a clip-like member formed integrally with the outer end thereof with the inner surfaces of adjacent clip-like members having upstanding recesses therein which face each other,

b. an inturned flange-like member carried by each end of said side plate and disposed to pass between said adjacent clip-like members, and

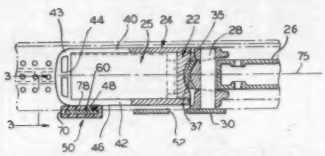
c. at least one laterally extending projection carried by said inturned flange-like member in position to snap into an adjacent upstanding recess between adjacent clip-like members so that said inturned flange-like member is attached to said clip-like members.

4,055,254

SELF LUBRICATING YOKE WEAR PLATE ARRANGEMENT

Osvaldo F. Chierici, Elmhurst, and Richard F. Murphy, Aurora, both of Ill., assignors to Holland Company, Lombard, Ill.

Filed Aug. 10, 1976, Ser. No. 713,189
Int. Cl.[2] B61G 7/10
U.S. Cl. 213—61 **7 Claims**



1. In a draft gear rigging for railroad cars having a channel shaped center sill opening downwardly and extending longitudinally of the car, with the rigging mounted at the end of the car and comprising a draft gear applied within the draft gear pocket between stops spaced longitudinally of the car and within the center sill, which draft gear is embraced by a yoke extending longitudinally of the car and operably connected to the car coupler, with the yoke being supported by a wear plate secured at its ends at the underside of the center sill, and with the underside of the yoke riding on the wear plate to dispose the yoke underside at its operative level within the center sill, the improvement wherein:

said wear plate is planar in configuration and parallels and is coplanar with the underside of the center sill,

and including a liner interposed between the wear plate upper side and the yoke underside on which the yoke inner end rides,

said liner being formed from an ultra high molecular weight polymer of dry self lubricating characteristics characterized by having surfacing that resists adherence thereto of foreign matter but which surfacing resurfaces during use the yoke underside portion that engages the liner for reforming said yoke under surface portion to define a mirror finish,

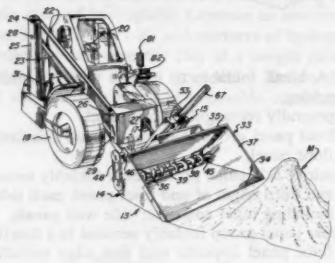
and means for securing the liner to said wear plate for maintaining said liner in place between the yoke and the wear plate.

4,055,255

MEASURED MATERIAL DELIVERY APPARATUS AND METHOD

Jose Arthur Vasquez, 2963 Champa St., Denver, Colo. 80205

Filed Feb. 6, 1976, Ser. No. 656,581
Int. Cl.[2] G01G 19/10
U.S. Cl. 214—2 **4 Claims**



1. Measured material delivery apparatus comprising, in combination:

a self-propelled vehicle;

a boom mounted on and projecting out from said vehicle;

a first selectively controlled, two-way hydraulic cylinder arranged to raise and lower the boom between a lowered scooping position, a raised travel and weighing position and a further raised dispensing position;

a carriage assembly including a frame mounted at the end of the boom for pivotal movement about a horizontal axis and a carriage body movable up and down relative to said frame;

a second selectively controlled, two-way hydraulic cylinder coupled between said boom and said frame for moving said frame about a horizontal axis;

a bucket mounted on said carriage body for conjoint movement with said carriage body and for being positioned by said boom, said bucket having a centrally disposed dispensing opening in the bottom of a selected restricted size;

a closure member for said dispensing opening adapted to move between a closed and an open position;

a third selectively controlled hydraulic cylinder arranged for selectively moving said closure member between said open and closed positions,

a fourth selectively controlled hydraulic cylinder mounted on said frame and coupled to said carriage body for raising and lowering the bucket relative to said frame;

a fluid pressure indicating gauge coupled to said fourth hydraulic cylinder so that the weight of the load in the bucket elevated by said fourth hydraulic cylinder is reflected as pressure on the indicating gauge that is calibrated to indicate the weight of the load of the material in the bucket;

a dispensing auger in the bottom of said bucket driven by a selectively controlled hydraulic motor for moving controlled amounts of a load of material collected in the bucket toward and through said dispensing opening until

a selected weight remains and for dispensing substantially all of said weighed material through said discharge opening into a selected receiving area below said discharge area when said boom is in said raised dispensing position.

4,055,256

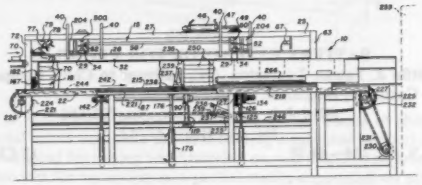
PACKAGE STACKING METHOD AND APPARATUS

Hans Hagedorn, 947 Huntington Crescent, North Vancouver, British Columbia, Canada (V7G 1M4)

Filed Oct. 14, 1975, Ser. No. 622,386

Int. Cl.[2] B65G 57/06

U.S. Cl. 214—6 DK **22 Claims**



1. Apparatus for stacking packages comprising an elongated horizontal support, feeding means for feeding packages one by one on to one end of the support such that the force imparted to the packages on the feeding means is transferred to the packages on the support to cause each package on the support to move the package ahead thereof longitudinally of the support to form a plurality of successive rows of a predetermined number of packages, longitudinal guides along opposite sides of the support spaced laterally apart sufficiently to prevent the packages from rotating during movement over the support, first stop means at an opposite end of the support to engage the leading package of each row for stopping movement of each row onto or along the support when the predetermined number of packages are on the support, means to stop the packages from being fed to the support when said leading package is engaged by the first stop means, a depressible elevator positioned beneath the support and extending the length thereof, means for shifting the support after each row is formed thereon to deposit said row on to the elevator, means for depressing the elevator by substantially one package thickness after each row is deposited thereon, thereby forming stacks of predetermined numbers of packages on the elevator, a conveyor beside the elevator and extending longitudinally the length thereof, said conveyor being positioned at the level of the elevator when said elevator is in its lowermost depressed position, a first wall extending longitudinally on the side of the elevator remote from the conveyor above the elevator when the latter is in said lowermost position and a further wall extending longitudinally on the side of the elevator opposite from the first wall, said first and further walls positioned to confine the stacks of packages on the elevator therebetween as the stacks are being formed thereon, said first wall also being a portion of a pusher for pushing the stacks transversely across the elevator onto the conveyor, said pusher also including a power means connected to said first wall and operable to shift the first wall across the elevator and back again to shift the package stacks in a row laterally off the elevator and on to the conveyor and said further wall being shiftable to an inoperative position to permit the movement of the stacks by the pusher from the elevator to the conveyor.

4,055,257

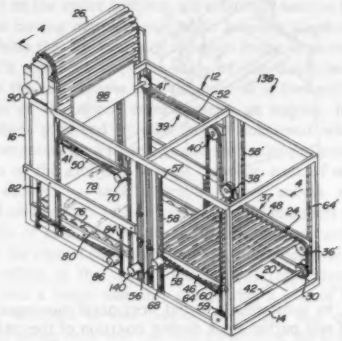
STACKING APPARATUS

Charles Krebs, San Clemente, Calif., assignor to Molins Machine Company, Inc., Camden, N.J.

Filed May 4, 1976, Ser. No. 683,159

Int. Cl.[2] B65G 57/02

U.S. Cl. 214—6 DK **11 Claims**



1. Apparatus comprising:

a. a frame,

b. an endless conveyor supported by said frame, a plurality of rotatable guide members in contact with said conveyor, a group of said guide members being supported so that their elevation may be changed, said conveyor having a horizontal top run and a bottom run, said conveyor having spaced platforms,

c. motor means connected to said conveyor for driving said conveyor,

d. first and second carriers supported by said frame for independent movement in a vertical direction, each carrier being adjacent a separate portion of the top run of said conveyor, each carrier supporting at least two of said group of guide members, said second carrier being downstream from said first carrier,

e. discrete motors for moving said carriers in a vertical direction,

f. means adjacent said second carrier for transferring articles off one of said conveyor platforms while said one platform is located along the top run of said endless conveyor and supported by said second carrier, and

g. conveyor means for receiving articles transferred from said platforms.

4,055,258

SHEET MATERIAL DE-STACKING MACHINE

Willi A. Schneider, Pfisterholzli 9, 8606 Greifensee, Zurich, Switzerland

Filed Feb. 2, 1976, Ser. No. 654,418

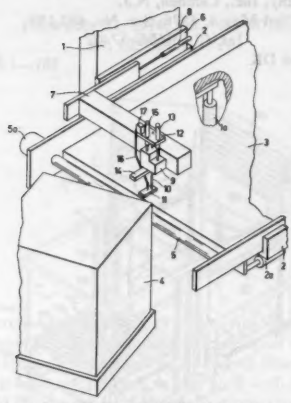
Claims priority, application Switzerland, May 9, 1975, 5968/75

Int. Cl.[2] B65G 59/02

U.S. Cl. 214—8.5 C **7 Claims**

1. A sheet material de-stacking machine for removing a partial stack from a stack of sheet material, comprising a machine frame, a table top which is horizontally movably mounted on said frame, a drivable separating roller which is arranged adjacent a front edge of said table top that is to be inserted into said stack of sheet material, a gripping device horizontally movably mounted on said frame and including upper and lower jaws for gripping an edge of said partial stack, and means for moving said gripping device horizontally against said stack, for gripping an edge of said partial stack with said gripping jaws, and for then holding said gripping

device with the gripped edge stationary during travel of said table top between the partial stack and remaining stack of sheet



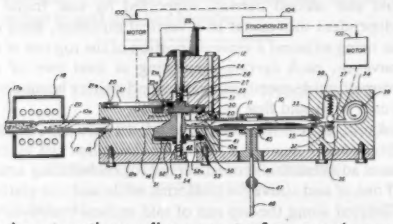
material, to substantially avoid horizontal movement of the sheets of said partial stack during insertion of the table top.

4,055,259

SAMPLE TRANSPORT WITH ROTARY AIR INTERLOCK CHARGING AND DISCHARGING MEANS

Joseph Sibrava, Fairfield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 3, 1976, Ser. No. 663,537
Int. Cl.[2] G01N *1/02, 31/12*
U.S. Cl. 214—17 A **7 Claims**



1. An automatic sampling apparatus for conveying a series of discrete sample quantities to and from an analysis chamber comprising:

means defining a conduit having one end adapted to be sealingly coupled in flow communication with said chamber;

a sample inlet passage extending transversely into said conduit at a point remote from said one end and a sample discharge passage on the opposite side of said conduit, aligned with the sample inlet passage;

a first transfer plate disposed in normally-occluding relationship to said sample inlet passage, said transfer plate containing a sample-receiving aperture;

means mounting said first transfer plate for displacement to a loading position in which said aperture registers with said sample inlet passage;

a second transfer plate disposed in normally-occluding relationship to said sample discharge passage, said second transfer plate containing an aperture adapted to receive the residue of a sample quantity subsequent to analysis in said chamber;

means mounting said second transfer plate for displacement to a sample discharge position in which the aperture in the second transfer plate registers with the sample discharge passage;

means for sealing said first and second transfer plates around and with respect to the inlet and outlet sample passages respectively, said sealing means including a spring for each said transfer plate and said springs being compressed against said transfer plates respectively to exert the sealing forces in converging directions along the alignment axis of said sample passages; and

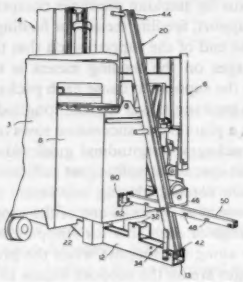
means for displacing said transfer plates in timed relation to one another to bring the aperture of the first plate into registration with the sample inlet passage while the sample discharge passage is occluded by the second transfer plate and the aperture of the second transfer plate into registration with the sample discharge passage when the sample inlet passage is occluded by the first transfer plate.

4,055,260

BATTERY EXTRACTOR FOR VEHICLES

Attila J. Tamas, Lexington, Ky., assignor to Clark Equipment Company, Buchanan, Mich.

Filed July 15, 1976, Ser. No. 705,660
Int. Cl.[2] B65G *67/42*
U.S. Cl. 214—44 R **12 Claims**



1. A battery extractor comprising an elongated base assembly adapted to abut at one end thereof the side of a vehicle, an elongated actuator handle bar pivoted from the end of the base assembly opposite the end which abuts the vehicle, an elongated ratchet bar connectible to a battery in a battery compartment of the vehicle at one end and to said handle bar at a plurality of adjustment positions thereof, said ratchet bar extending above and longitudinally of the base assembly and said handle bar being manually actuatable in both directions about its pivot connection to said base assembly at each adjustment position of said ratchet bar for extracting and inserting the battery from and into the battery compartment, and wherein said handle bar includes a pair of elongated side members having an opening therebetween in the area of said ratchet bar, a member connecting the sides of said handle bar through said opening, said ratchet bar having a plurality of notches spaced longitudinally of the lower side thereof engageable successively by said connecting member, said handle bar being pivotable in said both directions at each position of engagement with said ratchet bar, and wherein the remote end of said ratchet bar is connected to battery bracket means, successive pivotal movement in one direction from successive positions of adjustment of said handle bar in relation to said ratchet bar effecting an extraction of the battery from the vehicle onto said base assembly.

4,055,261

RE-STACKING DEVICE FOR STACKING PARTIAL STACKS OF SHEET MATERIAL TO FORM A COMPLETE STACK

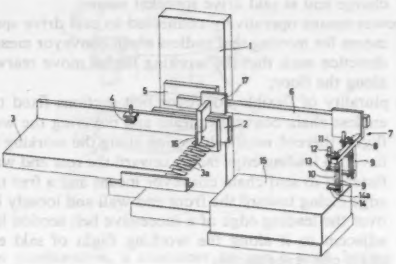
Willi A. Schneider, Pfisterholzli 9, CH-8606 Greifensee, Zurich, Switzerland

Filed Dec. 2, 1975, Ser. No. 637,036

Claims priority, application Switzerland, Dec. 16, 1974, 16662/74

Int. Cl.² B65G 57/10

U.S. Cl. 214—6 G 9 Claims



1. A re-stacking device for stacking partial stacks of sheet material into a complete stack, including a machine support, a slide adapted for raising and lowering on said machine support, a table top for receiving said partial stacks supported on said slide so as to be horizontally movable back and forth between two end positions, and a clamping unit arranged at the point where an edge of said table top is in one of said end positions, said clamping unit comprising at least one gripper with upper and lower clamping jaws having horizontally extending clamping surfaces, at least one slit being provided in the said edge of said table top for receiving said lower clamping jaw, said upper and lower clamping jaws being mounted so as to move vertically in unison and said upper clamping jaw being adapted for vertically raising and lowering relative to said lower jaw, for clamping an edge of a partial stack on the said edge of said table top without relative horizontal displacement between said table top and said partial stack before the latter is clamped between said clamping jaws.

4,055,262

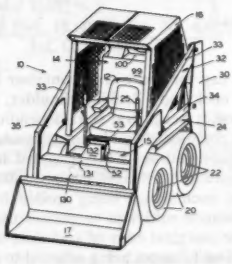
LOADER MAIN FRAME FOR SKID STEER LOADER

James J. Bauer, Lisbon; Larry E. Albright, Gwinner, both of N. Dak.; James L. Werner, Lamar, Mo.; Thomas M. Sagaser, and Lonnie D. Hoechst, both of Gwinner, N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Feb. 2, 1976, Ser. No. 654,256

Int. Cl.² L02F 3/62

U.S. Cl. 214—140 16 Claims



1. A skid steer loader vehicle and vehicle main frame in combination, the main frame comprising laterally spaced, longitudinally extending side beams on opposite sides of the tractor centerline, crossmembers at opposite ends of the side beams, a relatively narrow and elongate transmission case mounted between the side beams to form a bottom wall, and an upper member disposed between the side beams to define a top wall of a lower compartment area of the frame and a bottom wall of an upper compartment area of the vehicle, the upper compartment comprising an operator's compartment disposed between the lift arms of the vehicle, including a seat portion mounted on the upper member, the relatively narrow transmission case having opposite side walls laterally displaced sufficiently from the side beams of the main frame so as to provide operator's space on opposite sides of the transmission case between the side beams and the case at a forward vertical extension of the upper compartment, an engine, hydraulic drive means powered by said engine contained within said lower compartment, a pair of spaced stub axles projecting from the sides of the elongate case at opposite ends of said case, wheels driven by said hydraulic drive means rotatably mounted on said stub axles, a pair of upright members disposed outwardly of said side beams and projecting upwardly from adjacent the rear of each side beam on each side of said engine and providing at the upper ends thereof respective pivotal mounts, and a boom assembly comprising a pair of lift arms pivotally attached at said pivotal mountings and extending forwardly along each side and downwardly at the front in the lowered position, the lift arms mounting a material handling means at the lower end thereof, whereby provision of operator's space on opposite sides of the transmission case forward of the seat enables the operator to straddle the transmission case when he is seated in the vehicle, thereby lowering the operator profile for the vehicle.

4,055,263

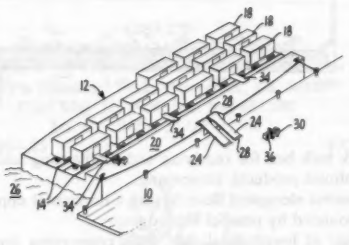
FREIGHT HANDLING METHOD

James W. Freeman, San Pablo, Calif., assignor to Naylor, Neal & Uilkema, San Francisco, Calif., a part interest

Filed May 28, 1976, Ser. No. 690,978

Int. Cl.² B65G 63/00

U.S. Cl. 214—152 4 Claims

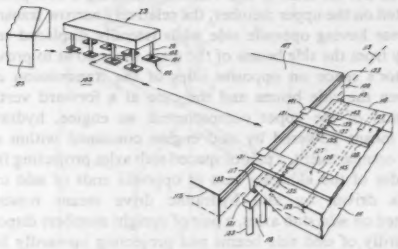


1. A freight handling method comprising loading freight cars onto a railroad car carrier vessel at a railhead transfer facility, moving said vessel to a dock having a freight storage facility associated therewith, loading said cars with freight from said freight storage facility, moving said vessel with its loaded freight cars to a railhead transfer facility, and moving said cars off of said vessel over said transfer facility for subsequent train makeup and destination shipping.

4,055,264
DECK SECTION LOADING

Phillip Andrew Abbott, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed Aug. 4, 1975, Ser. No. 601,661
Int. Cl.[2] B63B *35/42*; B65G *67/58*
U.S. Cl. 214—152 20 Claims



1. Method of transferring a load to a vessel grounded at a certain land based site comprising the steps of

grounding only that portion of the vessel which is adjacent to the site,

providing a fluid bearing path on the vessel and extending between the vessel and the site,

floating the load along the path onto the vessel on fluid bearings,

grounding the load on the vessel, and

floating the vessel,

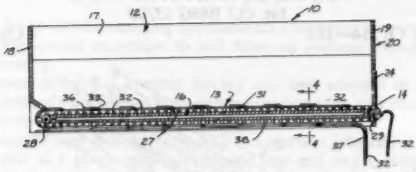
the vessel being grounded by ballasting, and

prior to load transfer the vessel being ballasted sufficiently to maintain itself level to within plus or minus two percent inclination during load transfer.

4,055,265
BULK BED

Leonard J. Eisenman, Box A, Eisenman Road, Boise, Idaho 83706

Filed Sept. 10, 1976, Ser. No. 722,040
Int. Cl.[2] B60P *1/38*; B65G *17/12*
U.S. Cl. 214—17 D 4 Claims



1. A bulk bed for receiving and discharging loads of bulk agricultural products, comprising:

a central elongated floor having a horizontal upper surface bounded by parallel side edges;

a pair of longitudinal side walls converging downwardly and inwardly to the respective side edges of the floor;

upright front and rear end walls joined to the side walls at the respective opposite ends thereof;

said floor, side walls and front and rear end walls presenting an upwardly open bin for the storage or transport of bulk agricultural products;

access means formed at the rear end wall and leading upward from the floor for selectively opening the interior of the bin at the rear end thereof for discharging bulk agricultural products therefrom;

drive sprocket means rotatably mounted to said bin about a transverse horizontal axis adjacent the rear end wall;

idler sprocket means rotatably mounted to said bin about a transverse horizontal axis adjacent the front end wall;

endless chain conveyor means entrained in meshing engagement about said drive sprocket means and said idler sprocket means, thereby forming coplanar working flights slidably supported along the full length of the floor adjacent the side edges thereof and parallel return flights beneath said floor, the working flights leading from a forward end at said idler sprocket means to a rear discharge end at said drive sprocket means;

power means operatively connected to said drive sprocket means for moving said endless chain conveyor means in a direction such that the working flights move rearwardly along the floor;

a plurality of flexible conveyor belt sections fixed to said endless chain conveyor means and covering the working flights thereof, each belt section along the working flights having a leading edge facing toward the rear end wall and fastened to said chain conveyor means and a free trailing edge facing toward the front end wall and loosely lapped over the leading edge of a successive belt section located adjacent to it along the working flight of said endless chain conveyor means;

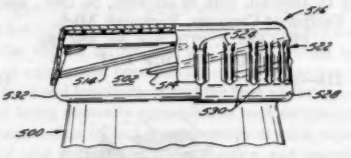
transverse support bars mounted to said endless chain conveyor means at longitudinally spaced locations thereon for supporting the overlapped belt sections as they move along the working flight; and

supporting plate means fixed below and parallel to the floor, said plate means extending substantially the full length of the floor and having an upper surface leading to a downwardly bent rear section positioned forwardly adjacent to the rear discharge end of the conveyor working flight, said supporting plate means being adapted to be slidably engaged by successive belt sections on the endless chain conveyor means after movement over said drive sprocket means for shifting the belt sections to an overlapped condition and supporting them in such condition as they move along the return flights of said chain conveyor means to said idler sprocket means.

4,055,266
COMBINATION CROWN TWIST-OFF CLOSURE CAPP

Arnaldo Amabili, 7680 Dollier Street, St. Leonard, Quebec, Canada

Filed Oct. 26, 1976, Ser. No. 735,781
Int. Cl.[2] B65D *41/34*
U.S. Cl. 215—252 10 Claims



1. A closure cap for use with a container having an externally threaded neck and a locking shoulder, said closure cap comprising a top, a peripheral skirt depending from the top, said skirt being corrugated and having threads formed thereon for mating engagement with the threaded neck of the container, and a plurality of flanges integral with and depending from said skirt, each flange being spaced from an adjacent flange by a distance sufficient to permit use of an opening device on a free marginal edge of said skirt between adjacent flanges, each of said flanges being adapted to engage the locking shoulder of said container, each of said flanges having at least one vertical line of weakening formed therein which rupture or spread on removal of said closure by an unscrewing motion to divide each flange into segments which flare out-

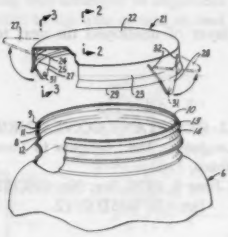
wardly by a camming action of the locking shoulder upon removal of the closure cap.

4,055,267

CAP FOR A WIDEMOUTHED CONTAINER

Richard L. Blair, 249 Mattson Ave., Los Gatos, Calif. 95030

Filed Sept. 13, 1976, Ser. No. 722,483
Int. Cl.[2] B65D *41/48*
U.S. Cl. 215—254 1 Claim



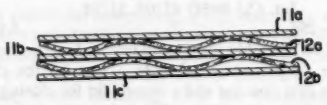
1. In combination, a container having a neck having an annular end with a substantially circular upper corner and a downward tapering lower curvature ending in a minimum diameter portion, a first and a second annular recess spaced from each other and below said minimum diameter portion; and a cap of a flexible plastic material deformable to accommodate minor variations in bottle dimensions and to permit said cap to stretch over said minimum diameter portion, said cap being preformed and having substantially uniform wall thickness throughout, said cap comprising a flat top disc having a diameter about equal to that of said neck, a depending skirt extending below said minimum diameter portion and having a pair of inwardly extending annular projections each fitting snugly in sealing engagement in one of said annular recesses, and pairs of depending tabs connected to said skirt to extend below said skirt on opposite sides thereof, said skirt being weakened by two pair of score lines extending from each pair of tabs and which are located on the outside surface of said skirt to prevent leakage from the bottle, said score lines being positioned on opposite sides of said tab and extending upwardly toward said flat top disc and diverging outwardly from each other and terminating in the skirt just above said minimum diameter portion and below said corner said skirt being tearable along each pairof score lines to open said cap, said cap in position on said neck sealing said neck against either input or output of any substance, said cap when torn along said score lines permitting removal of said cap from said neck and ready replacement thereof on said neck to reseal said bottle.

4,055,268

CRYOGENIC STORAGE CONTAINER

Alfred Barthel, Indianapolis, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 18, 1975, Ser. No. 633,087
Int. Cl.[2] B65D *25/18*
U.S. Cl. 220—9 C 9 Claims



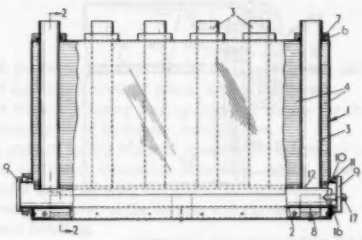
1. A container for storing materials at low temperatures comprising an inner vessel for holding such material; a larger outer gas-tight casing having rigid self-supporting walls around said inner vessel of such size to form an intervening evacuated load-free space at an absolute pressure less than about 0.5 micron mercury, said space containing multi-layered thermal insulation comprising thin flexible sheet radiation barriers being supported by and in alternating relation with low conductive fibrous sheet layers in the permanently precompacted form weighing less than 2 grams/ft^2 and being comprised of fibers having 3–40 microns effective diameter and an intrinsic thermal conductivity of less than 0.2 BTU/hr-ft^2-F/ft, said fibers being arranged in overlaying crossing relationship in planes parallel to the sheet surface with at least 1% (by number) of the fibers being heat softenable and heat self-bonded directly to each other at some of the cross-points without external binder, and said fibrous sheet layers undulating within the spacing between adjacent radiation shields over a transverse distance substantially wider than its thickness, contacting first one shield than the other facing shield.

4,055,269

TANK FOR HOLDING LIQUID

Joseph John Hurley, Paisley, Scotland, assignor to J. & P. Coats Limited, Glasgow, Scotland

Filed May 17, 1976, Ser. No. 686,906
Claims priority, application United Kingdom, May 20, 1975, 21424/75
Int. Cl.[2] B65D *7/22, 25/18*
U.S. Cl. 220—10 6 Claims



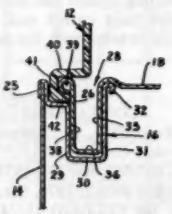
1. A tank for holding liquid comprising a casing, an elongated horizontal chamber disposed in the lower half of said casing, removable closure means accessible from the exterior of the casing for closing the ends of the chamber, a plurality of parallel vertical tubular shafts open at the top projecting upwardly from the chamber to the top of said casing and thermal insulating material surrounding the chamber and the vertical shafts within the casing.

4,055,270

MULTIPLE CHAMBER PACKAGE

J. Larry Underwood, c/o Underwood Mold Co., Inc., 104 Dixie Drive, Dixie Industrial Park, Woodstock, Ga. 30188

Filed May 12, 1976, Ser. No. 685,680
Int. Cl.[2] B65D *51/18, 43/06*
U.S. Cl. 220—23 5 Claims



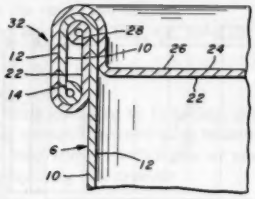
1. An assembly of two container in which an auxiliary container is connected to a first container and it closure member,

comprising a first container having an open end bordered by an outer wall, a closure member closing said first container, said closure member and first container having interengaging means to secure said closure member to said first container radially inwardly of said outer wall, said closure member having a radially outwardly projecting rim, a second auxiliary container having an open end bounded by a wall formation, said wall formation surrounding and closely fitting said rim and have a peripherally extending bead formation projecting radially inwardly from the periphery of said wall formation at said open end and underlying said rim, said wall formation at the open end of said second container closely fitting in the wall at the open end of said first container and being confined between said rim and said wall at the open end of said first container, said rim of said closure member overlying said bead formation to prevent separation of said containers when said closure member is secured to said first container.

4,055,271
SHEET METAL CONTAINER

Howard W. Kronenwetter, Tarentum, and Freddy R. Schultz, Lower Burrell, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed June 22, 1976, Ser. No. 698,587
Int. Cl.[2] B65D *7/42*
U.S. Cl. 220—64 **3 Claims**



1. A sheet metal container comprising:

a body member with interior and exterior surfaces protectively coated and the edge surfaces uncoated, having a body flange extending generally radially outwardly of the longitudinal axis of the container at the end thereof, the terminal end of said body flange being curled such that the entire uncoated edge surface is disposed inside the curl, and at least a portion of the interior surface of the curled body flange is butting against the exterior metal surface of the body member, and

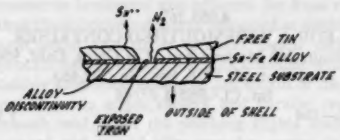
an end member having a different electrode potential than said body member with interior and exterior surfaces protectively coated and the edge surfaces uncoated, having a wall fitting within the body member and an end flange extending generally radially outwardly of the longitudinal axis of the container at the end thereof, the terminal end of said end flange being curled such that the entire uncoated edge surface is disposed inside the curl, and at least a portion of the exterior surface of the curled end flange is butting against the interior metal surface of the end member, said curled end flange subsequently rolled into a double seam with the curled body flange.

4,055,272
CONTAINERS

Ronald E. Beese, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 645,685, Dec. 31, 1975, Pat. No. 4,033,274.
This application July 2, 1976, Ser. No. 702,344
Int. Cl.[2] B65D *25/14*
U.S. Cl. 220—64 **4 Claims**

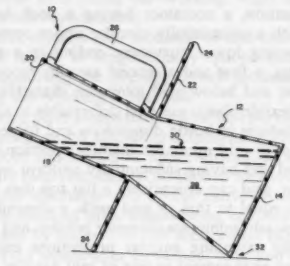
1. A drawn, seamless, closed bottom container of shell form drawn from a steel starting blank having an adherent layer of tin, characterized, at least on the inside, by an in-situ formed undrawn substantially continuous layer of tin-iron alloy next to the steel weighing at least 0.03 pounds per BB, and a substantially continuous layer of unalloyed tin next to the tin-iron alloy layer.



4,055,273
SPILL-RESISTANT CONTAINER

Dennis J. Jones, Loogootee, Ind., assignor to Tumble Not Tumbler, Inc., Loogootee, Ind.

Filed June 4, 1976, Ser. No. 693,102
Int. Cl.[2] B65D *7/42*
U.S. Cl. 220—70 **11 Claims**



1. A spill-resistant container comprising a truncated conical base with a bottom wall and upstanding side walls, said base being for receiving and holding a quantity of a liquid; a neck extending upwardly from the upper extents of the base side walls, said neck terminating at its upper end to form a relatively wide-mouthed opening having a cross sectional dimension substantially less than the cross sectional dimension of said base at the bottom wall thereof; and a ring carried on the container generally at the top of said base and generally intermediate the height of the container, said ring extending radially outwardly from the container and having an outside diametric dimension generally equalling the container height to support the container when tipped in a partially upright position to prevent spillage of liquid therefrom.

4,055,274
DUAL LID FOR CLOSING COUPLED OPENINGS

Gunter Waldenmeier, Karlsruhe, and Wilhelm Hempelmann, Leopoldshafen, both of Germany, assignors to Geseilschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Aug. 17, 1976, Ser. No. 715,171
Claims priority, application Germany, Sept. 12, 1975, 2540722
Int. Cl.[2] B65D *45/00, 51/18*
U.S. Cl. 220—256 **5 Claims**

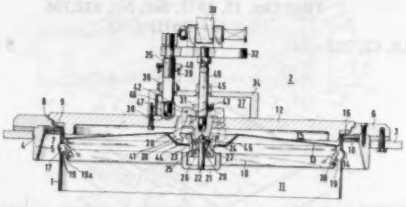
1. In a dual lid assembly for closing first and second coupled openings, the lid assembly including a first lid for closing fluid-tight the first opening and a second lid for closing fluid-tight the second opening, the two lids being entirely separable from one another and each having a lid axis; lid connecting means for coupling fluid-tight the two lids to one another; first actuating means coupled to the lid connecting means for operating the lid connecting means by an externally-applied force; lid locking means for tightening the first lid to a wall defining the first opening; second actuating means coupled to the lid

locking means for operating the lid locking means by an externally-applied force; the improvement comprising:

a. a bearing unit attached fluid-tight to the first lid in the center thereof;

b. a circumferential collar attached to said bearing unit, said circumferential collar being arranged at that side of said first lid which is oriented away from said first opening when said first lid is in position thereon; said circumferential collar projecting radially from said bearing unit with respect to the axis of said first lid;

c. a centering hub arranged in alignment with and displaceable parallel to the axis of said second lid;



d. hub supporting means attached to said centering hub and secured to said second lid;

e. means defining a circumferential channel provided in said centering hub; and

f. a plurality of clamps movably supported on said second lid; each clamp having an actuating portion projecting into said channel for moving said clamps into operative and inoperative positions by respective opposite axial motions of said centering hub; each clamp having a claw portion spaced from the respective actuating portion; in said operative position said clamps engaging, with their claw portion, behind said circumferential collar for securing said first and second lids to one another.

4,055,275

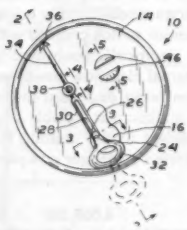
RETAINABLE TAB CONSTRUCTION FOR SEALED CANS

Herbert Gontar, 6 Westchester Ave., Pound Ridge, N.Y. 10576

Filed Jan. 3, 1977, Ser. No. 756,368

Int. Cl.[2] B65D *41/32*

U.S. Cl. 220—269 **14 Claims**



1. A sealed can comprising: a top, side walls, and a bottom defining a sealed interior compartment, the top having a weakened section defining a tab adapted to be disassociated from the top to provide access to the interior compartment, a first key engaging means extending from the weakened section, an elongated substantially rigid key, first connecting means for slidably connecting the key and key engaging means to facilitate manual engagement of the key and digital manipulation thereof to sever the tab from the top to provide a top opening defined by the weakened section, a second key engaging means extending from the top, and second connecting means for shifting the key and severed tab away from the opening to permit access to the interior compartment without interference from the key and severed tab.

4,055,276

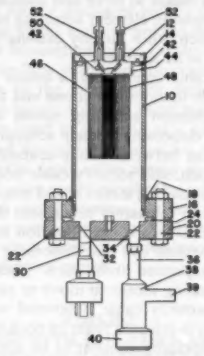
CONTAINER FOR HYDROGEN ISOTOPES

David E. Solomon, Ann Arbor, Mich., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Filed Jan. 16, 1975, Ser. No. 541,447

Int. Cl.[2] B67B *7/24*

U.S. Cl. 222—3 **7 Claims**



1. A portable container for the storage, shipping and dispensing of hydrogen isotopic gases, which comprises:

a. a hollow housing having opening means for the ingress and egress of hydrogen isotopic gas,

b. a mass of sorber material in said hollow housing composed of activated zirconium aluminate which forms a stable solid material with the gas to be stored,

c. means to control the ingress and egress of gas to and from said housing,

d. means associated with and carried by said container to heat said sorber material to drive sorbed gas from the housing, and

e. means externally of and carried by said container to connect said heater to an energy source.

4,055,277

FLUID DISPENSING ANTI-BURGLARY DEVICE

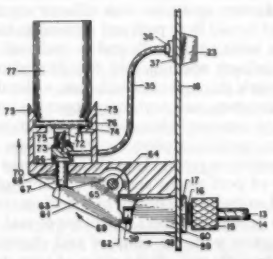
Charles R. Fegley, 1606 Frush Valley Road, Laureldale, Pa. 19605, and Anderson F. Johnson, Jr., 535 Grings Hill Road, Sinking Spring, Pa. 19608

Filed Mar. 18, 1976, Ser. No. 668,275

The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.

Int. Cl.[2] B65D *83/14*

U.S. Cl. 222—5 **11 Claims**



1. A fluid dispensing anti-burglar device, the device comprising:

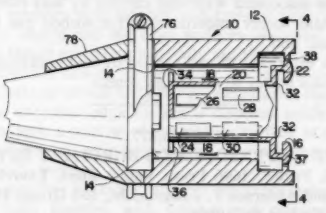
a. A body member having means for mounting said device;
b. a pressurized container having a fluid-dispensing element adapted to release fluid under pressure from said pressurized container when actuated;
c. means for supporting said pressurized container in said body member;
d. a passageway for directing the fluid discharge after release;
e. dispensing element actuating means mounted in said body member and adapted to engage and actuate said fluid-dispensing element;
f. spring means biased to force said fluid-dispensing element and said dispensing element actuating means into engagement with each other thereby causing said fluid-dispensing element to be actuated;
g. a security cable comprising, a means for fastening said security cable to an object at one end thereof and to said dispensing element actuating means on the other end thereof, said dispensing element actuating means mounted for movement between a non-acutation position and a release position, said security cable holding said dispensing element actuating means in said non-actuating position and adapted to releasably retain said dispensing element actuating means in a cocked position in which said fluid-dispensing element and said dispensing element actuating means are separated from each other, said dispensing element actuating means to move to said release position when said security cable is severed with whereby said spring means is released from its cocked position causing said fluid-dispensing element to be actuated, and fluid is released from said pressurized container to pass through said passageway.

4,055,278

DISPENSING SHOWER HEAD

Joseph A. Seymour, Haverhill, Mass., assignor to Lawrence Peska, Associates, Inc., New York, N.Y.

Filed Aug. 24, 1976, Ser. No. 717,132
Int. Cl.[2] B67D *5/60*
U.S. Cl. 222—42 **7 Claims**



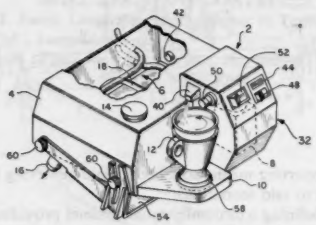
1. A dispensing shower head comprising an enclosure for attachment to a water supply, said enclosure having an influent opening and an effluent opening, a flow path being provided between said influent and said effluent opening in said enclosure, a shower spray on said effluent opening, a container positioned in said flow path and secured to said enclosure, said container having side walls and an end wall positioned opposite said influent opening, said container also having an opening accessible through said enclosure, a plurality of port means in said container, said port means opening into said flow path, a cartridge removably insertable in said container through said container opening, a plurality of chambers in said cartridge each chamber registerable with one of said port means, said plurality of port means and said plurality of chambers being arranged so that when one of said port means is in registration with one of said chambers, the other of said port means is not in registration with the other of said chambers and said container side walls seal off the other of said chambers from said flow path, said container is cylindrically shaped and said container is positioned in said enclosure so that the longitudinal axis of said container passing through said container end wall and said container opening is substantially parallel to said flow path, said port means are positioned in the side wall of said container, said cartridge is cylindrically shaped and rotatably mounted in said container so that the longitudinal axis of said cartridge and the longitudinal axis of said container are substantially in registration with one another, said chamber is rotatable to register with said port means.

4,055,279

LIQUID DISPENSER FOR A MOTOR VEHICLE

Dominic J. Lapera, and Joseph Lapera, both of 1801 Maplewood Drive, Lindenhurst, Ill. 60046

Filed Oct. 15, 1975, Ser. No. 622,756
Int. Cl.[2] B67D *5/62*
U.S. Cl. 222—54 **5 Claims**



1. A hot liquid dispenser for use in a motor vehicle having a liquid cooled engine, comprising: a unitary housing; a liquid storage tank within the housing; a heating coil within the storage tank having inner and outer co-axial tubes, the ends of the inner tube extending through the outer walls of the storage tank and the housing for connection with the engine's liquid cooling system for heating the stored liquid with a portion of the coolant, the outer tube being spaced from the inner tube by a small annular air gap, the ends of the outer tube extending outside the storage tank and the housing to provide a means for draining any coolant that might leak through the inner tube; an electric pump within the housing having an inlet tube extending into the lower portion of the storage tank and an outlet tube extending out of the housing for dispensing liquid from the storage tank; a thermal sensor extending into the lower portion of the storage tank to automatically determine if the liquid within the tank is at or above a minimum preset acceptable dispensing temperature substantially below the liquid's boiling point; a thermal sensor switch coupled with the thermal sensor, the switch being electrically connected in series between the pump and an external electrical power supply to prevent the stored liquid from being dispensed unless the liquid is at or above the preset minimum acceptable dispensing temperature; and a means attached to the housing for mounting the dispenser in the vehicle's passenger compartment.

4,055,280

DIVERTER VALVE ASSEMBLY FOR ICE DISTRIBUTION SYSTEMS

Vance L. Kohl, and Joseph R. Spinner, both of Albert Lea, Minn., assignors to King-Seeley Thermos Co., Ann Arbor, Mich.

Filed June 1, 1976, Ser. No. 691,355
Int. Cl.[2] B65H *3/60*
U.S. Cl. 222—70 **16 Claims**

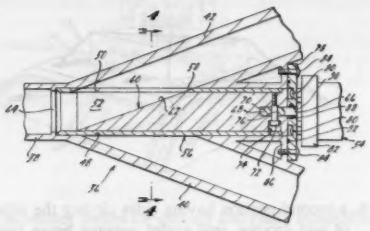
1. A diverter valve assembly for an ice distributing system including an ice source and first and second ice delivery stations,

said valve assembly comprising a generally cylindrically-shaped valve body having an inlet section communicable with the ice source and first and second outlet sections

communicable with the first and second delivery stations, respectively,

said valve body having a central cylindrical valve chamber communicable with said inlet and outlet sections and having a rotatable valve element located coaxially therein,

said valve element being of a generally cylindrical shape and having an outer diameter approximately equal to the diameter of said valve chamber having an ice blocking portion and an ice deflecting portion, and



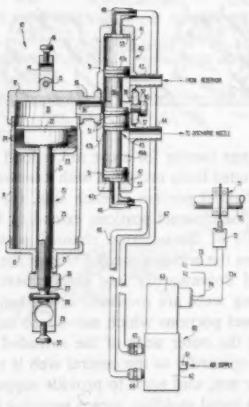
electrically energized motor means for selectively rotating said valve element between a first position wherein said blocking portion prevents the transfer of ice from said inlet section to said first outlet section and said deflecting portion permits the transfer of ice from said inlet section to said second outlet section, at a second position wherein said blocking portion prevents the transfer of ice from said inlet section to said second outlet section and said deflecting portion permits the transfer of ice from said inlet section to said first outlet section.

4,055,281

FILLING UNIT WITH AIR-OPERATED SPOOL VALVE SYSTEM

Sidney Rosen, Baltimore, and Richard Nelson Bennett, Arbutus, both of Md., assignors to National Instrument Company, Baltimore, Md.

Filed June 11, 1976, Ser. No. 694,930
Int. Cl.[2] G01F *11/06*
U.S. Cl. 222—309 **31 Claims**



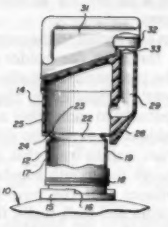
1. A valve system for a high-speed filling machine which includes a filling unit with pump means including a reciprocating metering piston defining a variable pump space and actuating means for said filling unit, said filling unit being adapted to be connected with connecting tube means to enable connection of a reservoir containing the product to be filled with discharge nozzle means, and said filling unit being operable to suck in the product to be filled during the suction stroke of the metering piston of its pump means by way of an intake section of said tube means and to discharge the product under pressure during the discharge stroke of the metering piston through the nozzle means by way of a discharge section of said tube means, characterized by spool valve means alongside said pump means including a spool-valve piston member and two connecting means valved by the spool-valve piston member for connection with said intake and discharge sections, said spool-valve means being operable to open the flow path from the connecting means for the intake section to the pump space of the pump means and interrupt the flow path from the pump space to the connecting means for the discharge section during the suction stroke of the pump means and to open the flow path from the pump space to the connecting means for the discharge section and to interrupt the flow path from the connecting means for the intake section to the pump space during the discharge stroke of the pump means, solenoid valve means adapted to be connected with its input to a source of a pneumatic medium under pressure and operatively connected with at least one output thereof to the spool-valve means so as to selectively displace the spool-valve piston member by selective feed of the pneumatic medium under pressure, an energizing circuit for said solenoid valve means including switch means, and means for closing said switch means in dependence on the angular position of said actuating means.

4,055,282

CONTAINER WITH ONE-PIECE NECK AND DISCHARGE CONTROLLER

Henry Komendowski, Des Plaines, Ill., assignor to Automatic Liquid Packaging, Inc., Elk Grove Village, Ill.

Filed Apr. 19, 1976, Ser. No. 678,220
Int. Cl.[2] B65D *47/10*
U.S. Cl. 222—421 **19 Claims**



1. A hermetically sealed plastic container having a body portion, a neck portion and a dispensing head all integrally formed,

a. said neck portion having a side wall which is of a predetermined outside diameter;

b. said dispensing head being integrally molded with and atop said neck portion and having an inside diameter which substantially corresponds with the outside diameter of said neck portion so as to slidably and frictionally receive said neck portion therein;

c. a severable annular groove provided between said neck portion and said dispensing head, said dispensing head being severed from said neck portion and the latter being received therein by exerting a downward force on said dispensing head to sever said annular groove and to forcibly urge said dispensing head about said neck portion;

d. a dispensing spout with an inlet opening formed in said dispensing head;

e. at least one indentation in said side wall of said neck portion for providing a communicating channel between the side wall of said neck portion and said dispensing head which is in communication with said dispensing spout when said dispensing head is disposed about said neck portion, whereby a product can be dispensed from said container through said neck portion, said communicating

channel and into said dispensing spout from which the product is expelled.

4,055,283

HOLDER FOR A SMOKING-PIPE

Adam L. Habler, 4851 Gandy Blvd. 15-2nd, Tampa, Fla. 33611

Filed May 12, 1975, Ser. No. 576,707
Int. Cl.[2] A45C *11/00*
U.S. Cl. 224—5 R **7 Claims**

1. A holder for smoking-pipe having a substantially straight stem and a bowl, comprising:

a substantially flat, substantially rigid sheath having

a. substantially rigid front and back walls each of a single material thickness, in opposed, substantially parallel relationship, the interior surface of one of said walls having a high friction surface area, said walls having top edges unconnected along substantially the entirety of their lengths and which define a mouth, longitudinal side edge portions, and a bottom edge portion, said side edge portions adjoining said bottom edge portion, and said portions in combination with said walls and said top edges, defining a cavity for receiving a substantially straight pipe stem, and

b. fastening means connected to the outer surface of one of the walls, for fastening the holder to a support in a manner that the pipe stem normally points downward toward the sheath bottom edge, the walls being sufficiently close spatially to each other and sufficiently taut laterally from side edge portion to side edge portion and transversely from wall to wall, that when the pipe stem is inserted through the mouth substantially fully into a cavity in a manner that the pipe bit is substantially parallel to the front and back walls, the interior surfaces of the walls, including the high friction surface area, engage and frictionally pinch-hold the upper and lower surfaces of the pipe stem sufficiently firmly that the pipe stem is firmly retained in the cavity even when the sheath is pointed downward, and,

c. as an individual element, a flexible hood removably connected to the sheath, adapted to be conformed to substantially the shape of the pipe bowl, the sheath and the hood having means for removably connecting the hood to the sheath, and the hood providing protection for the bowl and cooperating with the walls in retaining the stem in the cavity when the sheath mouth is pointed downward.

4,055,284

VEHICLE ARTICLE CARRIER

John A. Bott, 931 Lake Shore Drive, Grosse Pointe Shores, Mich. 48236

Continuation-in-part of Ser. No. 486,415, June 8, 1974, abandoned. This application Aug. 14, 1975, Ser. No. 604,643
Int. Cl.[2] B60R *9/04*
U.S. Cl. 224—42.1 D **8 Claims**

1. In an article carrier for an automotive vehicle,

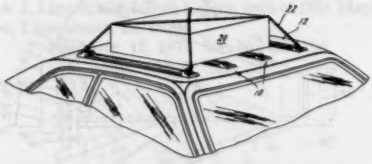
an article supporting slat adapted to be mounted in contiguous relation to a surface portion of the vehicle,

said slat having a longitudinally extending upwardly facing article supporting surface provided with a central upwardly presenting, longitudinally extending groove having converging side walls,

a one-piece combination end cap and tie-down member interfitted with a terminal end of said slat and adapted to facilitate securing articles upon said surface,

said one-piece combination member including,

a. a first portion defining an eyelet opening for receiving an article securing means,



b. a second portion having sides closing the adjacent end of said groove, said eyelet opening being spaced from said second portion to receive the article securing means,

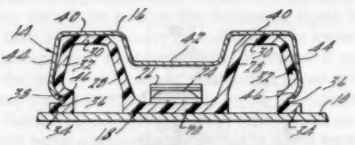
c. a third portion downwardly presenting from said second portion, said third portion being complementary in cross-sectional shape to said groove and adapted to be received at least in part within said groove at said terminal end of said slot, and fastening means securing said combination member to said slat.

4,055,285

ARTICLE SUPPORTING SLAT

John A. Bott, 931 Lake Shore Drive, Grosse Pointe Shores, Mich. 48236

Continuation of Ser. No. 486,416, July 8, 1974, abandoned. This application July 6, 1976, Ser. No. 702,756
Int. Cl.[2] B60R *9/04*
U.S. Cl. 224—42.1 D **4 Claims**



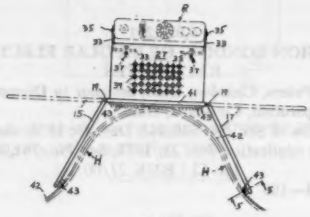
1. In a luggage carrier for a car top, a load supporting slat having an extruded body provided with a central web and with an inverted channel portion at each side, the bottom of the outer sides of the channel portions extending below the web, the outer walls of the inverted channel portions remaining stationary when the bottoms thereof engage the car top and the web is moved downwardly into engagement with the top, wherein sloping webs are provided at the top of each of the inverted channel portions which move into substantial planar relation when the outer sides of the extruded body are relatively moved upwardly as the central web is moved down to engage the car top, said webs to provide support in a vertical direction for a metal molding, means securing the central web to the car top, and a metal molding having a downwardly offset central web and inwardly downwardly presenting channels at the sides, the uppermost portions of each of said metal molding channels supported by the planar tops of the adjacent respective portions of the body, the outer sides of the metal molding channels engaging a substantial portion of the outer sides of the channels of the body to prevent the extruded body from bulging outwardly when the carrier is loaded.

4,055,286

PORTABLE MOUNT FOR RADIOS IN MOTOR VEHICLES

Charles F. Schmid, 3408 S. Fourth St., Springfield, Ill. 62703

Filed Dec. 22, 1975, Ser. No. 643,616
Int. Cl.[2] B60R *11/02*
U.S. Cl. 224—42.42 R **6 Claims**



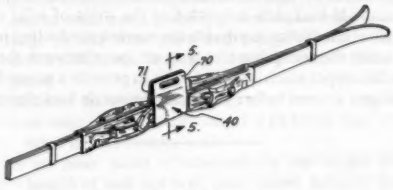
1. In a mounting means for quickly and easily attachably and detachably supporting a radio or like device over a hump in a floor defining a drive-shaft tunnel of a motor vehicle, the improvement comprising: a base lamina adapted to overlie the ridge of said hump, a lateral lamina swingably attached to each side margin of said base lamina in such manner that said laminae can relatively closely embrace the ridge and substantial side portions of said hump, continuous hinges for effecting said swingable attachment, channel moldng strips protectively embracing the outer edges of said base and lateral laminae, support structure attached to said base lamina and adapted for semi-permanent mounting of a radio or like device thereto, and means for quickly and easily attaching said laminae to spaced regions of said floor and said hump, said attaching means being flat strips adhesively bonded to the under faces of portions of said channel molding strips on all of said laminae, said flat strips having numerous small Velcro-type hooks projecting from their exposed under surfaces and cohesively engageable with nap or like structure on the surfaces of said floor and said hump.

4,055,287

PROTECTIVE COVERINGS FOR SNOW SKI BINDINGS WITH CARRYING CASE

Charles E. Champenois, Jr., 22 Woodcrest Road, R.D. No. 1, Boonton, N.J. 07005

Filed Sept. 16, 1976, Ser. No. 723,782
Int. Cl.[2] B65D *45/04*
U.S. Cl. 224—45 S **6 Claims**



4. In combination,

a pair of removable coverings for protecting snow-ski bindings, said coverings being constructed from a flexible sheet which may be arranged in a rectangular, multi-ply, folded configuration,

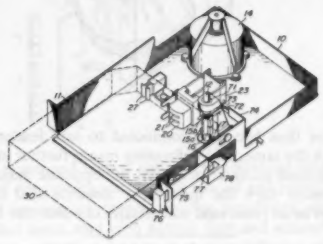
a pouch having an interior compartment shaped to receive and conform to said pair of coverings in said folded configuration, and handles attached to opposing edges of said pouch to form a sling for carrying skis by hand.

4,055,288

FRONT DRIVE CARTRIDGE-TAPE PLAYER SYSTEM WITH FAST FORWARD AND REVERSE MODES

Melvin Arthur Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 563,947, May 31, 1975, Pat. No. 4,034,925.
This application May 26, 1976, Ser. No. 690,122
Int. Cl.[2] G11B *23/10*
U.S. Cl. 226—1 **13 Claims**



1. In a tape player having a rotatably driven cylindrical capstan vertically oriented and positioned to rotatably drive the tape in a received tape cartridge at a rate dependent on capstan diameter, the method of selectively increasing the rate of tape drive comprising the steps of:

a. providing a plurality of crescents, each crescent having an inner face, an outer face and a vertical dimension the inner face of predetermined curvature to encircle greater than 180° of the of the capstan circumference while revealing a substantial arc on the capstan surface, the outer face of predetermined curvature, the vertical height predeterminedly fixed,

b. locating the crescents in a predetermined location on the capstan whereby each crescent is slidably rotatable thereabout,

c. decoupling and aligning the crescents in a first selected mode whereby capstan rotation is decoupled from the crescents and the crescents are aligned to allow the capstan surface to drivably engage the tape, and

d. coupling and aligning the crescents in a second selected mode whereby the crescents rotate with the capstan to drivably engage the tape, the crescents aligned in a predetermined configuration effectively increasing the capstan diameter.

4,055,289

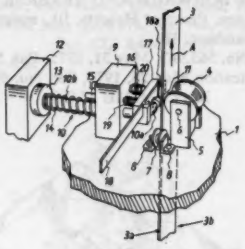
PHOTOGRAPHIC APPARATUS

Michael Kaiser, Germering, and Ludwig Schaffer, Munich, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 11, 1976, Ser. No. 666,005
Claims priority, application Germany, Mar. 22, 1975, 2512826
Int. Cl.[2] B65H *17/34*
U.S. Cl. 226—92 **14 Claims**

14. In a photographic apparatus, particularly a developing apparatus, a combination comprising a travelling leader tape having transversely spaced edges; a carrier to which material to be advanced by said leader tape is to be attached, said carrier being formed with a channel; first means for holding said carrier in position proximal to said leader tape; and second means for causing said leader tape to become lodged in said channel in sprung condition, so that the leader tape engages and entrains said carrier, said second means comprising deforming means including a deforming element mounted adjacent one major surface of said leader tape for deforming said

leader tape transversely of its direction of travel so that said edges become spaced from one another by a distance smaller than the width of said channel, effecting entry of said leader tape into said channel, and thereupon terminating said deflection so that said leader tape becomes sprung in said channel and



said carrier thus becomes connected to said leader tape for travel with the same, said deforming means further including a presser element mounted adjacent the opposite major surface of said leader tape for movement towards said deforming element so as to press said leader tape towards the same.

4,055,290

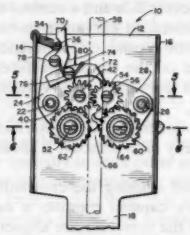
ROPE PULLING DEVICE

Floyd O. Elsas, 458 Arroyo Road, Santa Barbara, Calif. 93110

Filed Feb. 11, 1977, Ser. No. 767,758

Int. Cl.[2] B65H *17/26*

U.S. Cl. 226—128 **8 Claims**



1. A rope pulling device comprising:

a housing including first means to facilitate attachment to an exterior object:

a first plate pivotally mounted upon said housing;

a second plate pivotally mounted upon said housing, cam means interconnecting said first and second plates;

a drive gear rotatably mounted on said housing, said drive gear being in continuous engagement with a first driven gear and through an idler gear to a second driven gear, said first driven gear being rotatably mounted on said first plate, said second driven gear being rotatably mounted upon said second plate, said first driven gear connected to a first cog wheel causing simultaneous rotation therewith, said second driven gear connected to a second cog wheel causing simultaneous rotation therewith, said first cog wheel being spaced from said second cog wheel and movable relative thereto by pivoting of said first and said second plates;

handle means rotatably mounted on said housing and fixed to cause rotation of said drive gear;

biasing means interconnecting said first plate and said housing, said biasing means exerting a continuous bias upon said first plate tending to maintain both said first and second plates in the position with said cog wheels having minimum spacing therebetween; and

whereby upon manual rotation of said handle means said drive gear is rotated causing simultaneous reverse direction, identical velocity rotational movement of said first and second driven gears and therefore said first and second cog wheels, whereby a rope located between said first and second cog wheels is moved linearly in respect to said housing.

4,055,291

EXPLOSION BONDING OF BIPOLAR ELECTRODE BACKPLATES

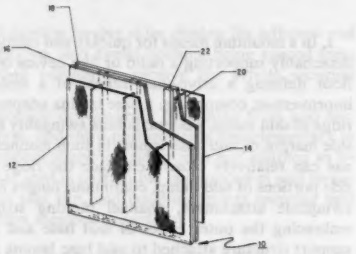
Edward J. Peters, Chardon, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Continuation of Ser. No. 640,643, Dec. 15, 1975, abandoned.

This application Jan. 21, 1977, Ser. No. 761,268

Int. Cl.[2] B23K *21/00*

U.S. Cl. 228—108 **4 Claims**



1. A method for mechanically and electrically connecting the anode and cathode backplates of a bipolar electrode comprising the steps of: placing a spaced series of strips of solid copper electrical conductor in a spaced relation of at least 0.001 inch (0.0254 mm) from an anode backplate made of a valve metal and parallel thereto; placing a layer of detonating explosive having a detonation velocity of less than 120 percent of the sonic velocity of the metal having the highest sonic velocity in the system, on the outside surface of one of the metal layers; initiating the explosive so that detonation is propagated parallel to the spaced series of strips of solid copper electrical conductor such that the pressure on collision of the spaced series of strips of solid copper electrical conductor with the anode backplate is greater than the elastic limit of the metal having the lowest elastic limit in the system; and connecting the cathode backplate having a metallic makeup selected from the group of iron, mild steel, stainless steel or nickel to the spaced series of strips of solid copper electrical conductor such that about **10** percent of the total area of the anode backplate or the cathode backplate is bonded to the strips of solid copper electrical conductor to provide the current conducting properties while the remaining area is an air space between the strips of solid copper electrical conductor to provide a means for the hydrogen to vent before it attacks the anode backplate.

4,055,292

CARTON WITH INTEGRAL SEPARABLE MEASURING VESSEL

Minoru Hosoya, Tokyo, Japan, assignor to Kao Soap Co., Ltd., Tokyo, Japan

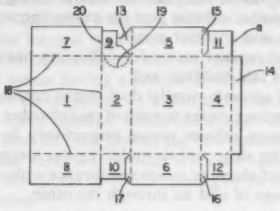
Filed Feb. 11, 1977, Ser. No. 767,680

Int. Cl.[2] B65D *5/76*

U.S. Cl. 229—17 M **12 Claims**

1. In a carton having side panels and end walls defining a closed chamber, the improvement which comprises: said carton has an external flap overlapping one of said side panels and

end walls and integral with said carton, said flap having lines of separation providing the side wall and bottom wall of a mea-



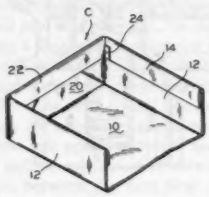
suring vessel which can be separated from the carton and then erected to form the measuring vessel.

4,055,293

TRAY WITH REINFORCED WALLS

Melchiore M. Stramaglia, Castro Valley, Calif., assignor to Container Corporation of America, Chicago, Ill.

Filed Feb. 4, 1977, Ser. No. 765,761
Int. Cl.[2] B65D *5/22, 5/24*
U.S. Cl. 229—31 FS **2 Claims**



1. In a tray type folding carton formed from a unitary blank of foldable sheet material such as paperboard, the combination of:

a. a bottom wall having opposed pairs of side and end walls foldably joined to and upstanding from opposed side and end edges thereof, and foldably joined to each other to form a box-like structure open at the top;

b. gusset means at each corner of said carton, each including a pair of generally triangular gusset panels foldably joined to each other and to respective end edges and side edges of adjacent side and end walls and folded into face-to-face engagement with inner surfaces of said end walls;

c. said side walls each including an outer panel foldably joined at its lower edge to a side edge of said bottom wall and an inner panel foldably joined at one edge to an upper edge of said outer panel and being folded inwardly and downwardly into face-to-face engagement with said outer panel;

d. said end walls each including:

i. an outer panel foldably joined at its lower edge to an end edge of said bottom wall;

ii. an inner panel of substantially less height than the height of said end wall outer panel, foldably joined at one edge to an upper edge of said end wall outer panel and folded inwardly and downwardly to overlie an upper marginal portion of said end wall outer panel;

iii. an intermediate panel foldably joined at one edge to a lower edge of said end wall inner panel and folded outwardly and upwardly to lie between said end wall outer and inner panels to provide reinforcement for said end wall and thereby minimize bowing thereof.

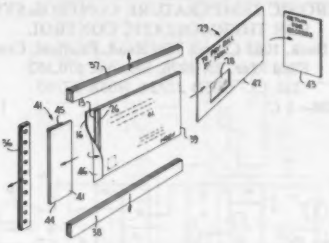
e. means forming an interlocking connection between adjacent side and end walls at the corners of said carton.

4,055,294

COMBINED MAILER AND RETURN ENVELOPE ASSEMBLY

John E. Traise, 885 Onondaga St., Lewiston, N.Y. 14092

Filed Dec. 11, 1975, Ser. No. 639,826
Int. Cl.[2] B65D *27/10, 27/06, 27/34*
U.S. Cl. 229—69 **3 Claims**



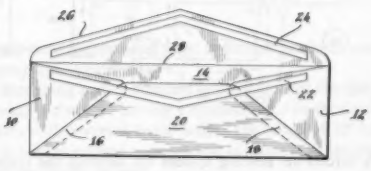
1. A combined mailer and return envelope assembly, comprising a continuous web having spaced and parallel transverse lines of weakening therealong for separating said web into individual units, said web having first and second spaced and parallel longitudinal fold lines therein defining adjacent first, second and third web portions, said first and third portions respectively overlying said second and first portions upon being folded along said respective first and second fold lines, said first and second portions of each said unit being adhesively secured together by adhesive means defining a pocket of a return envelope opening toward said first fold line, said third portion of each said unit being removably secured to said first portion and having an end lying adjacent said first fold line, a detachable end stub in said overlying web portions and including said end of said third portion, said second portion of each said unit having a first section adjacent said stub and a flap detachably secured to said section, said first portion of each said unit having a second section detachably secured thereto and overlying said first section as well as said flap, whereby removal of said stub facilitates removal of said third portion and exposes said return envelope, and removal of said sections exposes said flap for closing said return envelope packet.

4,055,295

SELF-SEALING ENVELOPE AND METHOD OF MAKING SAME

Robert Cohn, Millbrae, Calif., assignor to Champion International Corporation, Stamford, Conn.

Filed Sept. 15, 1976, Ser. No. 723,236
Int. Cl.[2] B65D *27/14*
U.S. Cl. 229—80 **4 Claims**



1. A method of making self-sealing envelopes from paper blanks including the steps of:

folding and sealing a body for the envelope using an adhesive having a predetermined dielectric constant, and allowing said adhesive to at least partially dry;

subsequently, applying a first strip of moist latex material to the body of the envelope and a second strip of moist latex

material to an attached flap in a position in which the second strip registers with the first strip when the flap is folded against the body of the envelope, the latex material having a dielectric constant approximately the same or less than the dielectric constant of the adhesive; and

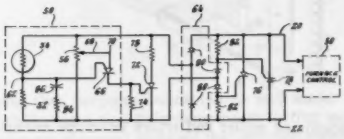
drying the envelope in a dielectric heating chamber.

4,055,296

ELECTRONIC TEMPERATURE CONTROL SYSTEM FOR THERMOSTATIC CONTROL

Robert J. Buck, 1063 Church Hill Road, Fairfield, Conn. 06430

Filed Mar. 25, 1976, Ser. No. 670,352
Int. Cl.[2] G05D *23/24*; H03K *17/60*
U.S. Cl. 236—1 C **11 Claims**



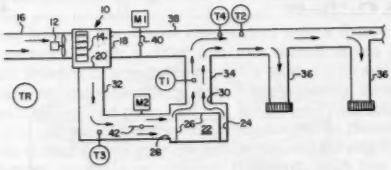
1. A temperature control system for thermostatic control of a standard two-wire voltage relay control mechanism without the presence of amplifiers and circuitry requiring a power source other than the low voltage relay control mechanism and the calibration of which is unaffected by relay voltage variations comprising a circuit having two main terminals, one terminal being adapted for connection to terminal of an alternating current operated relay of the low voltage heating and/or cooling system relay control mechanism, the circuit comprising a temperature sensing circuit including a temperature responsive thermistor and potentiometer adjustable in response to a desired temperature setting, a programmable unijunction transistor (PUT) the gate of which is connected to the thermistor and the anode of which is connected to the potentiometer wiper, a diode bridge connected across the system circuit main terminals and to the temperature sensing circuit and a SCR thyristor connected across the output of the diode bridge and to the cathode of the programmable unijunction transistor to conduct current during alternate half cycles of the alternating current through opposite legs of the bridge.

4,055,297

FORCED AIR HEATING SYSTEM UTILIZING FIREPLACE AS PRIMARY HEAT SOURCE

Sherman E. Lee, Rte. 1, Box 69A, Newberg, Oreg. 97132

Filed Oct. 18, 1976, Ser. No. 733,315
Int. Cl.[2] F23N *0/00*
U.S. Cl. 236—11 **13 Claims**



1. A forced air heating system for heating the rooms of a building comprising:

a. motorized fan means for circulating air;

b. a forced air furnace connected to said fan means having heating means for selectively heating air circulated through said furnace by said fan means and furnace exhaust means for exhausting said circulated air from said furnace;

c. a fireplace;

d. air heating chamber means adjacent said fireplace and connected to said fan means for receiving heat from said fireplace and thereby heating air circulated through said chamber means, said chamber means having means defining a chamber exhaust port for exhausting said circulated air from said chamber means;

e. air outlet register means for delivering heated air to the rooms of said building; and

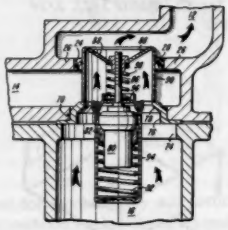
f. a pair of separate parallel duct means connecting said air outlet register means to each of said chamber exhaust port and furnace exhaust means respectively for conducting circulating air to said air outlet register means from either one of said chamber means and furnace without intermediate passage of said air through the other.

4,055,298

THERMALLY RESPONSIVE BY-PASS VALVE DEVICE PROVIDING MAXIMUM FLOW AREA

Earl L. Wilson, Wellesley, Mass., assignor to Standard-Thomson Corporation, Waltham, Mass.

Filed Jan. 19, 1976, Ser. No. 650,151
Int. Cl.[2] F01P *7/02*
U.S. Cl. 236—34.5 **6 Claims**



1. Thermally responsive valve mechanism for the cooling system of an automotive engine which has a plurality of flow passages, there being a first flow passage, a second flow passage, and a third flow passage, there being a first wall between the first flow passage and the second flow passage with an opening of a given dimension in the first wall, there being a second wall between the second flow passage and the third flow passage, the opening in the second wall having a greater dimension than the opening in the first wall, there being continuous fluid flow through the opening in the second wall during operation of the engine, the improvement comprising:

an annular valve seat member within the opening in the second wall, the annular valve seat member having a downstream opening which has a dimension substantially equal to the given dimension of the opening in the first wall, the annular valve seat member having an upstream opening which is greater than the downstream opening thereof, the valve seat member having an internal wall of gradually decreasing dimension between the upstream opening thereof and the downstream opening thereof,

a hollow cylindrical valve member slidably axially movable within the opening in the first wall, the hollow cylindrical valve member being engageable with the valve seat member to encompass the downstream opening and to close communication between the third flow passage and the second flow passage while providing communication between the third flow passage and the first flow passage, the hollow cylindrical valve member being movable to spaced relationship from the valve seat member to permit communication between the third flow passage and the second flow passage,

thermally responsive actuator means having a portion encompassed by the internal wall of the valve seat member, the thermally responsive actuator means having a movable portion, means attaching the movable portion of the thermally responsive actuator means to the hollow cylindrical valve member for axial movement thereof, the

thermally responsive actuator means having a portion of greater cross-sectional dimension and a portion of lesser cross-sectional dimension, the portion of greater cross-sectional dimension being at a position encompassed by a part of the internal wall of the valve seat member which has a greater dimension, and the thermally responsive actuator means having a portion of lesser cross-sectional dimension encompassed by a part of the internal wall of the valve seat member which has a lesser dimension, so that the area for fluid flow at the downstream opening of the annular valve seat member is at least equal to the area for fluid flow at the upstream opening of the annular valve seat member.

5. Thermally responsive valve mechanism for a cooling system of an internal combustion engine in which the system is provided with conduit structure having wall members forming a first flow passage, a second flow passage, and a third flow passage, there being a first opening between the second and first flow passages, and a second opening between the second and third flow passages, the first opening being greater than the second opening, the openings being in alignment, there being continuous fluid flow through the second opening during operation of the engine, the improvement comprising:

a hollow cylindrical closure member slidably axially movable within the second opening, the hollow cylindrical closure member having opposed open ends,

an annular valve seat member within the second opening and forming a fluid port therethrough, the annular valve seat member having a flow inlet opening and a flow exit opening, the flow exit opening being substantially equal to the second opening, the flow inlet opening being substantially greater than the flow exit opening, the annular valve seat member having an annular engagement surface encompassing the flow exit opening thereof and engageable by an end of the hollow cylindrical closure member to close communication between the first flow passage and the second flow passage while providing communication between the first flow passage and the third flow passage, the annular valve seat member having an internal wall surface of gradually increasing dimension between the exit opening and the entrance opening thereof,

a thermally responsive actuator device having a larger area portion encompassed by a larger diameter portion of the internal wall surface of the annular valve seat member, the thermally responsive actuator device having a smaller area portion encompassed by a smaller diameter portion of the internal wall surface of the annular valve seat member, so that the area for fluid flow at the flow exit opening of the annular valve seat member is at least equal to the area for fluid flow at the flow inlet opening of the annular valve seat member, the thermally responsive actuator member having a portion attached to the hollow cylindrical closure member for movement thereof.

4,055,299

ENERGY SOURCE FOR LARGE HEATING SYSTEMS

Lars Norberg, and Erik Olsson, both of Finspong, Sweden, assignors to Stal-Laval Turbin AB, Finspong, Sweden

Filed Aug. 4, 1976, Ser. No. 711,676
Claims priority, application Sweden, Aug. 5, 1975, 7508803
Int. Cl.[2] G05D *23/00*
U.S. Cl. 237—2 B **2 Claims**

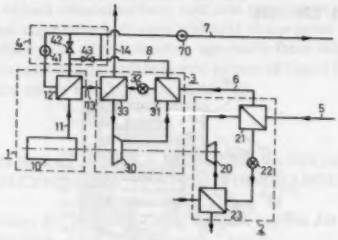
1. An energy source for a heating system of the type having a flowing medium to be heated, comprising:

a first heat pump having a first evaporator for withdrawing heat from the surrounding environment, a a first compressor, and a first condenser for rejecting heat to said medium to be heated;

a second heat pump having a second evaporator, a second compressor and a second condenser for rejecting heat to said medium to be heated;

a combustion engine drivingly connected to said first and second compressors, said engine having a first exhaust gas outlet;

a heat exchanger connected to receive exhaust gases from said first outlet and to reject heat from said gases to said medium to be heated, said heat exchanger having a second



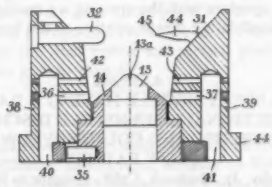
exhaust gas outlet for said gases, said second outlet being connected to direct said gases from said first heat exchanger to said second evaporator whereby fluid flowing in said second evaporator is heated as heat is withdrawn from said exhaust gases.

4,055,300

EQUIPMENT FOR SPRAYING PAINT AND THE LIKE

Michel Binoche, Paris, France, assignor to SKM, Stains, France

Filed Oct. 30, 1975, Ser. No. 627,052
Claims priority, application France, Nov. 14, 1974, 74.37534; Mar. 10, 1975, 75.07362
The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.
Int. Cl.[2] B05B *5/02*
U.S. Cl. 239—15 **12 Claims**



1. Equipment for spraying paint or similar products comprising a spray gun comprising:

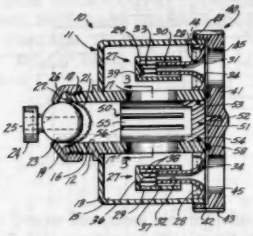
a. an atomizing nozzle adapted to project a flat fan-like jet of liquid, said nozzle having a frustoconical surface configuration with a vertex angle within the range of 80° to 110° with a front surface symmetrical in relation to the plane of said flat liquid jet and

b. a pair of lateral jets of compressed air disposed symmetrically in relation to and directed towards said atomizing nozzle at points slightly sufficiently set back from the front end of the atomizing nozzle to create air sheets after rebounding from the nozzle surface which are coaxial to a jet of paint sprayed from said nozzle, said air jets meeting each other while clamping the sheet of paint sprayed from said nozzle.

4,055,301
SHOWER HEAD WITH DIVERGENT IMPACT EFFECT NOZZLE

John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corporation, Burbank, Calif.

Filed July 19, 1976, Ser. No. 706,465
Int. Cl.[2] B05B 1/08, 1/16
U.S. Cl. 239—101 14 Claims



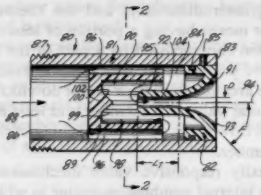
1. A shower head comprising
a. a body defining therein a cavity and having a front face defining an opening therein,
b. means coupled to the body adapting the body to be connected to a source of water for flow of water from the source into the cavity,
c. a nozzle disposed in the cavity with a discharge end thereof mounted in alignment with the opening for discharge of water from the cavity only through the nozzle, the nozzle having no moving parts and being arranged to produce a randomly directionally unstable discharge characteristic in water discharged therefrom during use, and
d. modulating means mounted to the body operable by a user of the shower head for modulating the effective force of water discharged by the nozzle, the modulating means including a plate disposed externally of the body adjacent a front face thereof, a slot aperture through the plate and disposed in the plate for registry of all portions thereof at different times with the opening in response to movement of the plate relative to the body, and screen means including mesh screening of at least two different effective meshes disposed in only a portion of the slot aperture, the modulating means having a first position in which the unscreened portion of the slot aperture registers with the opening and in which alignment of the screened portion of the slot aperture with the opening is a modulating position of the modulating means relative to the body.

4,055,302
LIQUID SPRAY NOZZLE HAVING A RANDOMLY DIRECTIONALLY UNSTABLE DISCHARGE CHARACTERISTIC AND COUNTERFLOW INTERNAL FLOW PATTERN

John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corporation, Burbank, Calif.

Filed July 19, 1976, Ser. No. 706,464
Int. Cl.[2] B05B 1/08
U.S. Cl. 239—102 27 Claims

1. A nozzle for producing a randomly directionally unstable liquid discharge comprising a body defining therein a chamber having a liquid inlet thereinto and a liquid outlet duct therefrom to the exterior of the body, the liquid flow area of the inlet to the chamber being at least as great as the minimum liquid flow area of the outlet duct, the liquid inlet to the chamber being defined for flow of liquid into the chamber in a direction substantially opposite to the direction of liquid flow from the chamber through the outlet duct, the chamber being defined cooperatively with the inlet and the outlet duct for substantially linear flow of liquid through the outlet duct during operation of the nozzle, the outlet duct having an straight throat portion of constant diameter communicating from the chamber to a flared section portion of the duct, the duct throat portion having a ratio of length to diameter in the range from about ½ to about 18, the diameter of the duct second portion increasing proceeding along the duct from the chamber from a

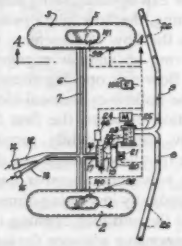


diameter equal to that of the duct throat portion, the angle of flare of the duct second portion relative to the axis of the throat at the intersection of the duct throat and second portions being at least 2° and no greater than 6°.

4,055,303
AGRICHEMICAL SPRAYING SYSTEM

Erben G. Brown, San Marcos, Calif., assignor to Golden State Helicopter, Inc., San Marcos, Calif.

Filed Feb. 5, 1976, Ser. No. 655,341
Int. Cl.[2] B05B 1/20, 17/02, 7/26; B01F 7/08
U.S. Cl. 239—142 5 Claims



1. In combination with an aircraft, an apparatus for continuous formation and spraying of an invert emulsion from at least one water phase and at least one oil phase, wherein at least one of said phases contains an active agrochemical agent, which comprises:
at least two concentric, vented, funnel-shaped tanks on one side of the aircraft;
at least two similar funnel-shaped tanks on the other side of the aircraft;
an outlet on the bottom of each tank;
a cross-tube connecting each outlet to the outlet of the similar tank at the opposite side of the aircraft each pair of interconnected tanks holding one of said phase;
a filling pipe connected to each cross-tube;
one multifluid valve assembly for co-mingling said phases into a premix comprising:
at least two inlets each leading to a channel controled by a common on-off gate formed by a plate sliding across said channels to completely close them,
a separate metering gate across each said channel formed by a plate having a hole in its center, sliding across said channel to partially close it, and
a common outlet area connected to all said channels;
conduit means, for delivering each one of said phases to said valve assembly, branching off each cross-tube, each leading to one of the inlets of said valve assembly;
a single low speed pump means;
a mechanical stirring means for turning said premix into an invert emulsion comprising:

a chamber having an inlet and an outlet, and a plurality of rotary agitators mounted within said chamber;

at least one spray-forming means;

conduit means for delivering said premix to said pump means and from said pump means to said mechanical stirring means; and

conduit means for delivering said invert emulsion to said spray forming means.

4,055,304

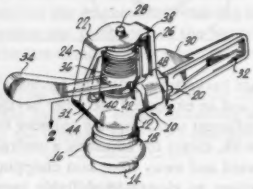
AUXILIARY BRAKING MEANS FOR IMPACT ARM SPRINKLERS

Robert L. Munson, San Dimas, Calif., assignor to Rain Bird Sprinkler Mfg. Corporation, Glendora, Calif.

Filed June 24, 1976, Ser. No. 699,354

Int. Cl.² B05B *3/00*

U.S. Cl. 239—230 **13 Claims**



1. In an impact type rotary sprinkler having a body rotatably mounted on a fluid supply conduit, an impact arm rotatably mounted on said body for rotary oscillation about said body, an armspring carried by said body for urging said impact arm into contact with a portion of said body, a nozzle carried by said body oriented to direct a discharge stream against said arm to cause rotation thereof out of contact with said body and away from said stream, said armspring resisting said rotation and causing said arm to reverse its direction of rotation and to impact said body to impart an increment of rotation thereto in a forward direction, the improvement comprising:

auxiliary means carried by said body for supplementing the action of said armspring, and for preventing said impact arm from imparting any rotation to said body in a reverse direction, said means being activated by said arm after it has rotated through a predetermined arc, whereby said auxiliary means operates to prevent reverse rotation of said body when the rotational force applied to said arm by said discharge stream exceeds predetermined limits.

4,055,305

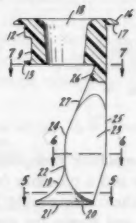
NON-CLOG WATER DISTRIBUTION NOZZLE

Joseph Michael Schwinn, Healdsburg, Calif., assignor to Ecodyne Corporation, Lincolnshire, Ill.

Filed May 5, 1976, Ser. No. 683,586

Int. Cl.² B05B *1/26*

U.S. Cl. 239—524 **10 Claims**



1. A gravity liquid spray nozzle comprising at its upper end a tubular member for placement in a liquid discharge opening, a hole through said tubular member for directing non-pressurized liquid into a downwardly flowing stream, a single conical baffle that creates a circular spray pattern, said baffle having a sharp point at its upper end spaced below the center of said hole, the spray creating surface of said conical baffle being defined by an arc of a circle rotated about an axis passing through said center of said hole, and a baffle supporting arm extending downwardly from said tubular member and being connected to said conical surface, said arm tapering to a knife-like terminal edge which merges into said sharp point of said conical surface, said edge extending upwardly from said point at the central axis of said nozzle in said stream of liquid flowing downwardly under the influence of gravity.

4,055,306

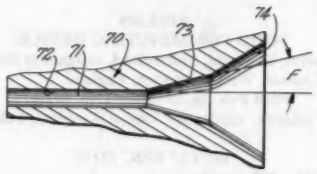
LIQUID SPRAY NOZZLE HAVING A RANDOMLY DIRECTIONALLY UNSTABLE DISCHARGE CHARACTERISTIC

John O. Hruby, Jr., Burbank, Calif., assignor to Rain Jet Corporation, Burbank, Calif.

Filed July 19, 1976, Ser. No. 706,466

Int. Cl.² B05B *1/08*

U.S. Cl. 239—601 **24 Claims**



1. A nozzle for producing a randomly directionally unstable liquid discharge comprising a body defining therein a chamber having a liquid inlet thereto and a liquid outlet duct from the chamber to the exterior of the body, the liquid flow area of the inlet to the chamber being at least as great as the minimum liquid flow area of the outlet duct, the chamber being defined cooperatively with the inlet and the outlet duct for substantially linear flow of liquid through the outlet duct during operation of the nozzle, the outlet duct having a straight throat portion of constant diameter communicating from the chamber to a flared second portion of the duct, the duct throat portion having a ratio of length to diameter in the range of from about 4 to about 18, the diameter of the duct second portion increasing proceeding along the duct from the chamber from a diameter equal to that of the duct throat portion, the angle of flare of the duct second portion relative to the axis of the throat at the intersection of the duct throat and second portions being at least 2° and no greater than 6°.

4,055,307

MATERIAL PROCESSING APPARATUS

Robert M. Williams, Ladue, Mo., assignor to Williams Patent Crusher and Pulverizer Company, St. Louis, Mo.

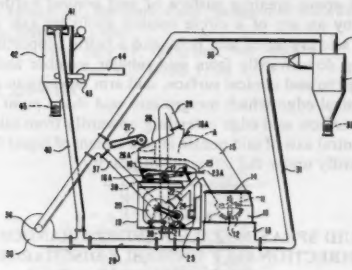
Filed Aug. 16, 1976, Ser. No. 714,623

Int. Cl.² B02C *23/14*

U.S. Cl. 241—48 **8 Claims**

1. Material processing apparatus comprising: a housing having a material inlet and an outlet; a material reducing mill connected into said housing at said outlet and said mill having a discharge chamber for reduced material; reduced material separator means having an inlet connected into said discharge chamber and also having an outlet; air moving means having a suction inlet connected to said outlet of said separator means and a discharge connected to said discharge chamber, the air from said air moving means transporting the reduced material to said separator means and returning air from said separator means outlet to said air moving means; conduit means connecting said housing into said air moving means discharge in advance of said discharge chamber to by-pass said mill, whereby

material in said housing is continually transported to said separator means through said discharge chamber, and means con-



nected into said air moving means discharge in advance of said connection to said discharge chamber to reduce the pressure in the apparatus to less than ambient.

4,055,308

FOOD COMMINUTING DEVICE

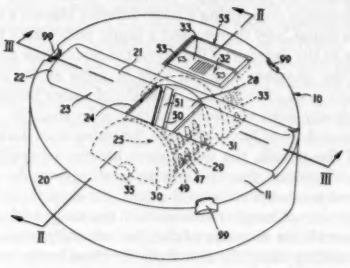
Peter Ackeret, Kusnacht, Switzerland, assignor to Salter Housewares Limited, West Bromwich, England

Filed Feb. 26, 1976, Ser. No. 661,477

Claims priority, application United Kingdom, Feb. 26, 1975, 7946/75

Int. Cl.² B02C *18/18*

U.S. Cl. 241—100 **31 Claims**



1. A device for use in comminuting solid food bodies by rasping, grating or cutting carried out by manually moving each food body under pressure over a stationary comminuting unit, said device comprising:

a. a comminuted food material collector bowl;

b. a lid structure which detachably fits upon and covers said bowl;

c. a channel extending across said lid structure defining a food body guideway bounded by lateral guide surfaces and a base surface integral with said lid structure;

d. a slot aperture in the base surface of said channel guideway intermediate its ends;

e. at least three different comminuting units of substantially planar configuration movably mounted and housed in said lid structure, said different comminuting units having comminuting elements of different comminuting characteristics and each having apertures for passage therethrough of comminuted food material fragments; and

f. means for selectively presetting each comminuting unit by displacement within said lid structure from a protectively shielded out-of-use position to an exposed operative working position in registry with said slot aperture in the channel guideway ready for use.

4,055,309

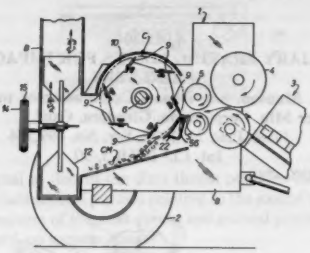
ADJUSTABLE CUTTER BAR SUPPORT

Phillip F. Fleming, and Steven J. Campbell, both of West Bend, Wis., assignors to Gehl Company, West Bend, Wis.

Filed Oct. 12, 1976, Ser. No. 731,121

Int. Cl.² B02C *18/16*

U.S. Cl. 241—221 **13 Claims**



1. In a forage harvester of the type having a rotatable chopping cylinder and an elongated shear bar having a longitudinal axis, located adjacent said chopping cylinder for cutting cooperation therewith, means for adjusting a central portion of said shear bar toward and away from said chopping cylinder, said means comprising an elongated shiftable member having an axis parallel to the longitudinal axis of said elongated shear bar and having one portion engagable with said central portion of said bar, whereby shifting of said member causes corresponding movement of said central portion of said cutter bar toward and away from said cylinder, means for shifting said elongated shiftable member to any one of a plurality of adjusted positions, said elongated shiftable member comprising a shaft rotatable about said axis and including a projection extending therefrom and engagable with said central portion, and further including means for releasably securing said shiftable member against shiftable movement.

4,055,310

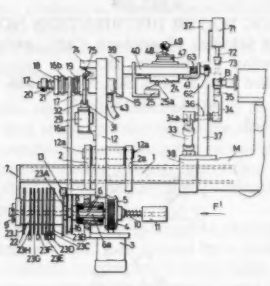
TAPING DEVICE IN COIL WINDERS

Francesco Bonaiti, Saronno (Varese), Italy, assignor to Tekma Kinomat S.p.A., Caronno Pertusella, Italy

Filed July 8, 1974, Ser. No. 486,681

Int. Cl.² H01F *41/12*

U.S. Cl. 242—7.08 **11 Claims**



1. A coil winding machine comprising in combination a stepwise rotating table and a plurality of supports distributed about the periphery of the rotating table, each support carrying at least one coil core, and means for applying and winding a discrete length of insulating adhesive tape on the periphery of a coil wound on each said core, said means comprising:

a support plate, means mounting the support plate on the machine for rotation about the axis of a said wound coil,

and a reel of feed tape mounted freely rotatable on said support plate;

means mounted on the machine for causing said support plate to oscillate from a rest position, away from the wound coil, to a working position in proximity to said coil;

first guide means, mounted on said support plate in such a position that, with the support plate in said working position, said guide means is closely adjacent said wound coil, said first guide means guiding said tape in a plane parallel to the axis of said coil;

second guide means, disposed at a short distance from the first guide means and also mounted on said support plate, the tape running between said first and said second guide means along a first path substantially perpendicular to the axis of the wound coil, said tape running also between said second guide means and said reel, along a second path substantially parallel to the axis of the said coil;

means mounted on the machine for retaining the free end of the tape against the periphery of the wound coil; means actuating the last-named means when the winding of said tape starts;

means mounted on the machine for cutting off said discrete length of the tape; and means actuating the lastnamed means after the winding of at least one turn of tape.

4,055,311

DEVICE FOR WINDING UP YARNS

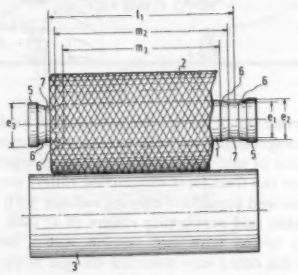
Jurgen Bock, Bobingen, Germany, and Hans-Jürgen Strutz, Spartanburg, S.C., assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 27, 1975, Ser. No. 591,303

Claims priority, application Germany, July 4, 1974, 2432166

Int. Cl.[2] B65H *54/40, 75/18*

U.S. Cl. 242—18 DD **1 Claim**



1. A device for winding up yarns on empty bobbins which comprises an empty bobbin rotating on a clamping device, a friction roll contacting the surface of the empty bobbin, a traversing device for the yarn to be wound up, the diameter of the empty bobbin decreasing relative to the center of the empty bobbin in the vicinity of reverse travel of the traversing device, the empty bobbin diameters and the length of the empty bobbin and the winding on the bobbin corresponding to the following unbalanced equations:

$$\text{a) } 0.05 \text{ mm} \leqq e_2 - e_1 \leqq 4 \text{ mm and}$$

$$\text{b) } \frac{l_1 - m_3}{l_1} \leqq 1, \text{ and}$$

$$\text{c) } \frac{l_1 - m_2}{l_1} \leqq 0.3,$$

where

l_1 is the length of the winding on the bobbin,

m_2 is the smallest distance between the sections of the smallest bobbin tube diameter at the points of reverse travel of the traversing device,

m_3 is the length of the section of unchanged diameter in the center of the empty bobbin between the two sections of decreasing empty bobbin diameter

e_1 is the empty bobbin diameter at the point of reverse travel, and

e_2 is the maximum empty bobbin diameter between the points of reverse travel of the traversing device, and

both ends of the empty bobbin being provided with starter rings the diameter e_3 of which exceeds the diameter e_2 by less than 2mm, preferably less than 1.4 mm.

4,055,312

PROCESS AND EQUIPMENT FOR THE MANUFACTURE OF YARN OR THREAD ON A REEL MACHINE

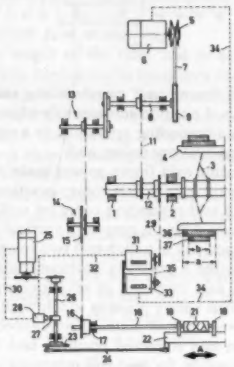
Florian Lucke, Stuttgart, Germany, assignor to Croon & Lucke Maschinenfabrik GmbH & Co. KG, Germany

Filed Nov. 24, 1975, Ser. No. 634,617

Claims priority, application Germany, Dec. 21, 1974, 2460845

Int. Cl.[2] B65H *54/28*

U.S. Cl. 242—43.1 **5 Claims**



1. In a yarn or thread spooling apparatus comprising a rotary driven reel basket and yarn or thread laying means for guiding said yarn or thread along superimposed layers of predetermined width wound about said reel basket, the improvement comprising reciprocating support means for said yarn or thread laying means for spooling said yarn or thread along superimposed layers of a larger width than said predetermined width, means for counting a first number of revolutions of said reel basket, means operated by said counting means for shutting off said reciprocating support means after said first number of revolutions, and means for shutting off said rotary driven reel basket upon completion of a predetermined second number of revolutions.

4,055,313

APPARATUS FOR EXCHANGING REWOUND ROLLS IN A ROLL SLITTING AND REWINDING MACHINE

Toshiaki Yamaguchi; Keizo Narita, and Hideo Mukai, all of Kyoto, Japan, assignors to Nishimura Seisakusho Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 393,835, Sept. 4, 1973, abandoned. This application July 18, 1975, Ser. No. 597,402

Int. Cl.[2] B65H *35/02*

U.S. Cl. 242—56.4 **12 Claims**

1. An apparatus for rewinding slitted material from a slitting machine and exchanging rewound rolls, comprising:

a frame;

a plurality of slitted rewinding roll support means mounted onto said frame and arranged in two horizontally extend-

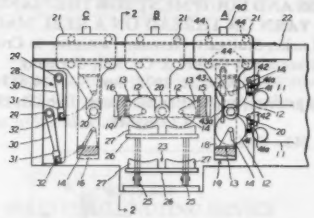
ing rows, each of said roll support means including a rewinding core rotatably and detachably mounted to said roll support means for receiving slitted material from a slitting machine and drive means for winding said core;

a carrier rotatably supporting said frame;

pivotal support means between said carrier and said frame for pivotally supporting said frame on said carrier about a horizontal axis of said frame, said horizontal axis being intermediate of and generally parallel to said two rows of slitted strip rewinding roll supporting means;

guide means adapted to provide a track for allowing forward and retracted movement of said carrier;

roller means on said carrier for mounting said carrier on said guide means;



means for positioning said carrier along said guide means from a forward position substantially adjacent said slitting machine for a rewinding operation, to a retracted position for a roll removal operation; and

means for rotating said frame approximately 90° about said horizontal axis from a first rotary position in which said two rows of said rewinding cores on said rewinding roll support means define a generally vertical plane, to a second rotary position in which said two rows of said rewinding cores define a generally horizontal plane,

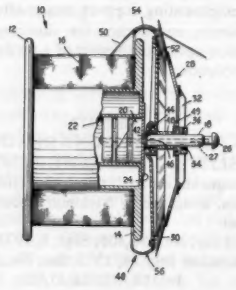
such that when said carrier is in said forward position, said frame is in said first rotary position to allow all of said rewinding cores to rewind slitted material simultaneously and when said carrier is in said retracted position, said frame is in said second rotary position for said roll removing operation.

4,055,314

WIRE PAY-OFF CAP ASSEMBLY FOR WIRE SPOOLS

Joseph J. Kovaleski, Easton, Conn., assignor to Wyrepak Industries, Inc., Bridgeport, Conn.

Filed Sept. 17, 1976, Ser. No. 725,095
Int. Cl.[2] B65H *49/00*
U.S. Cl. 242—128 **9 Claims**



1. A wire pay-off cap assembly for use with wire-filled, flanged spools to control the unreeling of wire past the ends thereof, comprising in combination:

a. a support member,

b. a stationary circular brush carried by said support member and having radially extending tines disposed adjacent the rim of one flange of the spool, and

c. a freely rotatable wheel carried by the support member,

d. said wheel being constituted of at least two separate pieces, one piece comprising a disk-like body having a bearing at its center for engagement with the support member, and the other of said pieces comprising a wheel flange having an annular exterior surface for sliding contact with a strand of wire being unreeled, and

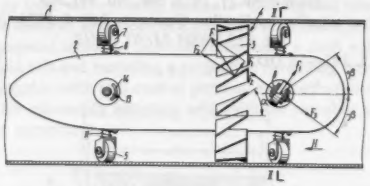
e. cooperable attachment means on the body and wheel flange for releasably securing the two together whereby the flange, when worn or damaged, can be readily replaced without removing the body from the support member.

4,055,315

DEVICE FOR PIPELINE TRANSPORTATION OF LOADS BY FLUID FLOW

Konstantin Shalvovich Gvelesiani, ulitsa Pekina, 21, kv. 84; Zauri Mikhailovich Kadzhelashvili, ulitsa Mikeladze, 20, kv. 12; Alexandr Shalvovich Tskvitinidze, poselok TEVZ, kvartal 11, korpus 30, kv. 71; Otari Shalvovich Tusishvili, ulitsa Telavskaya, 17; Andrei Illarionovich Sherezadashvili, ulitsa Saakadze, 24; Gamlet Varlamovich Khabuliani, prospekt Vazha-Pshavela, kvartal IV, korpus 3, kv. 7; Lia Nakhshonovna Bakhanova, ulitsa Lermontova, 1, and Otari Vardenovich Tatishvili, Gldansky massiv, I mikroraion, korpus 20a, kv. 83, all of Tbilisi, U.S.S.R.

Filed Apr. 14, 1976, Ser. No. 676,713
Int. Cl.[2] B65G *51/06*
U.S. Cl. 243—33 **12 Claims**



1. A device for pipeline transportation of loads by the flow of fluid comprising: a body; a turbine wheel mounted on said body; blades of said turbine wheel set at an acute angle to the direction of the fluid flow; supporting rollers arranged at least in two rows and capable of moving radially with respect to the pipeline axis; said supporting rollers of at least one row mechanically linked with said turbine wheel; said supporting rollers of the other row mounted on said body; axles of said supporting rollers connected with said turbine wheel and set at an angle to the direction of the fluid flow, the value of said angle depending on the direction of movement of the device in the fluid flow.

4,055,316

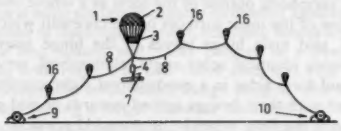
METHOD AND EQUIPMENT FOR AERIAL TRANSPORT

John Lester Chipper, Bates Street, Rabaul, Papua, and Donald Bruce Owner, Taurama Road, Port Moresby, Papua, both of New Guinea

Filed Apr. 7, 1976, Ser. No. 674,635
Int. Cl.[2] B64B *1/50*
U.S. Cl. 244—33 **6 Claims**

1. A method of aerially transporting loads between two sites, said method including the steps of locating a winch assembly at each of said two sites, attaching a ballasted inflated lift balloon by a cable to each winch assembly so that the lift balloon can be moved from one site to the other by winding cable on to a winch of one assembly and releasing cable from the winch of the other assembly, connecting removable support balloons to each cable to support the cable above any obstacles between

sites, winching the lift balloon to one site whilst progressively removing and adding support balloons to the respective cables, loading the lift balloon at one site by suspending a load from the lift balloon, ejecting an amount of ballast corresponding to the load added to the lift balloon, winching the lift balloon to the other site whilst removing and adding support balloons to the respective cables, removing the load from the lift balloon at said other site and reballasting the lift balloon and repeating the steps as above to return the ballasted balloon to said one site.



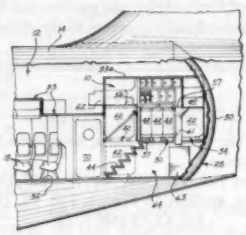
2. Equipment for aerial transport of loads between two sites comprising an inflated lift balloon, a dischargeable ballast holder connected to said balloon for ballast thereof, means for attachment of said load to said balloon, two winch assemblies each of which includes a winch, cables connecting the lift balloon to said winch assemblies and to each site, means for storing support balloons at each site, means for coupling said support balloons to said cables connecting said lift balloon to each said site, and means at at least one of the sites to add ballast to the ballast holder.

4,055,317

AFT MAIN DECK SPLIT LEVEL GALLEY

Rashad S. Greiss, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 30, 1976, Ser. No. 701,109
Int. Cl.[2] B64D *11/04*
U.S. Cl. 244—118 P **11 Claims**



1. In an airplane fuselage having a passenger deck, a ceiling, an aft end, and an aft pressure bulkhead, said bulkhead defining a concave recess in the rearward direction, said passenger deck abutting said bulkhead adjacent the bottom thereof, an improved galley for storing and preparing food for service to passengers on board said passenger deck comprising:

a personnel supporting floor positioned adjacent said bulkhead, said floor being spaced above said passenger deck and being positioned below said ceiling by a distance sufficient to allow average head room for personnel standing on said floor, said floor abutting said bulkhead at a location thereon spaced rearwardly from the location at which said passenger deck abuts said bulkhead,

means for connecting said floor with said passenger deck for providing access for personnel between said floor and said passenger deck, and

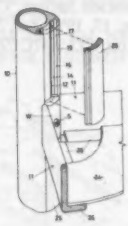
means located on said floor for storing food-containing modules and for preparing food for service to passengers on said passenger deck.

4,055,318

CONSTRUCTION ELEMENT

Herbert John Duckett, New Plymouth, New Zealand, assignor to Tasman Joinery Company Limited, New Plymouth, New Zealand

Filed Sept. 23, 1976, Ser. No. 726,008
Claims priority, application New Zealand, Oct. 24, 1975, 179053
Int. Cl.[2] A47G *29/02*
U.S. Cl. 248—243 **8 Claims**



1. A construction joint comprising:

a continuous length of the tube, rod or other extruded or rolled section, having on its periphery two seatings, each of said seatings including a tongue and a pair of substantially perpendicular abutment faces adjacent said tongue;

two strips, each strip having a forward edge at one end thereof, each strip including a groove; and

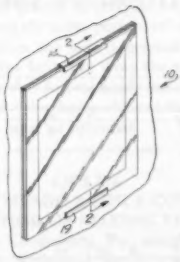
a screwably connected wedge, said two seatings being adapted to hold said one end of each of said two strips at a pre-determined angle to the line of the continuous length and to hold said wedge between said two strips, such that the two strips are firmly held into the seatings, each of said abutment faces engaging with said forward edge corner of one of said strips each of said tongues interlocking with said groove in one of said strips.

4,055,319

METAL PICTURE HANGER

Walter E. Pendock, 2910 Erie Blvd. East, Syracuse, N.Y. 13224

Filed July 21, 1976, Ser. No. 707,359
Int. Cl.[2] A47G *1/16*
U.S. Cl. 248—491 **1 Claim**



1. A metal picture hanger for holding a picture, stiff backing and cover glass comprising an elongate top U-shaped channel having front and rear spaced parallel legs with the rear leg internally reverted to form a hook, said top channel adapted to enclose the top edges of said picture, said backing and said glass, an elongate bottom U-shaped channel having front and rear spaced parallel legs with the rear leg internally reverted to form a hook, said bottom channel adapted to enclose the bottom edges of said picture, said backing and said glass, a wire secured at one end to the hook of one of said channels, a tension spring secured at one end to said wire and at the opposite

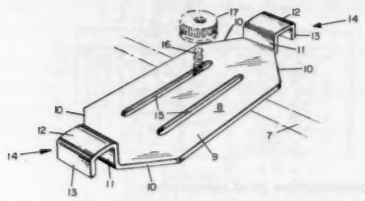
end to the other of said channels, said spring and said wire securing said channels against disengagement, a braided portion adjacent the upper end of said wire, a hanger card threaded on said wire and engaging said braided portion, said card having a hole to receive a mounting nail for hanging the picture on a wall.

4,055,320

CHAIR CLAMP AND RESTRAINT

Robert J. Bengtsson, Colorado Springs, Colo., assignor to AMI Industries, Inc., Colorado Springs, Colo.

Filed Aug. 17, 1976, Ser. No. 715,125
Int. Cl.[2] A47C *7/00*
U.S. Cl. 248—501 **4 Claims**



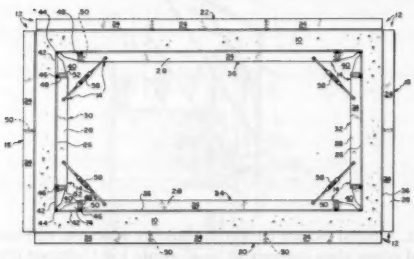
1. In combination with a chair having legs and leg frame members, said frame members connecting the front and rear legs, and a mounting track on a mounting surface for said chair, of a chair mounting bracket extending at right angles to said track and spans said leg frame members, said bracket including a generally flat midsection, generally inverted U-shaped clamp means at opposing ends of said bracket, apertured means in said midsection, and bolt means anchored in said track received in said apertured means, said clamp means fitting over and interengaging with said leg frame members whereby said chair is slidably adjustable relative to said bracket and track during reciprocable movement of said chair but restrained from other movements.

4,055,321

INSIDE CONCRETE COREWALL FORM WITH PARTICULAR THREE-WAY HINGE ASSEMBLIES THEREFOR

Vernon R. Schimmel, Arlington Heights, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Dec. 6, 1976, Ser. No. 736,860
Int. Cl.[2] E04G *15/06;* **B28B** *7/30*
U.S. Cl. 249—182 **11 Claims**



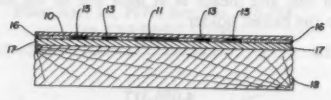
1. An inside articulated and collapsible concrete form for a rectangular corewall, said form comprising four form sides arranged in quadrilateral relationship, each side including an outwardly disposed facing with a marginal reinforcing frame having side and end rails, and a three-way corner hinge assembly operatively connecting each pair of adjacent end rails together, each hinge assembly embodying a pair of elongated main hinge leaves having their proximate ends hingedly connected together for swinging movement of the leaves toward and away from each other between an extended position wherein such leaves define a right angle, and a collapsed position wherein such leaves define an acute angle, and a pair of secondary hinge leaves having their proximate ends hingedly connected to the distal ends of said main hinge leaves, and means for fixedly securing each of said secondary hinge leaves to the adjacent end rail, said main hinge leaves, when in their right angular relationship, serving to maintain the form in a fully expanded condition wherein each of said facings is coplanar with one main hinge leaf of each adjacent hinge assembly so that the peripheral outline of the form as a whole conforms to the outline of the inner surfaces of the corewall which is to be formed, said main hinge leaves of the hinge assemblies, when assuming identical acute angle relationships, serving to maintain said form sides in a quadrilateral right angular relationship and with their facings spaced inwards of said peripheral outline of the form when in its extended position.

4,055,322

PERMEABLE LINER HAVING CONCRETE SETTING RETARDANT

Hugh I. Cassidy, 2845 Yorba, San Francisco, Calif. 94116

Filed Nov. 13, 1975, Ser. No. 631,485
Int. Cl.[2] B28B *7/36*
U.S. Cl. 249—187 R **8 Claims**



1. An article for preparing concrete with a textured pattern on the surface thereof comprising:

A. a water permeable membrane,

B. a pattern on one side of said membrane with said pattern delineated by a water soluble retardant which retards setting of cement, and

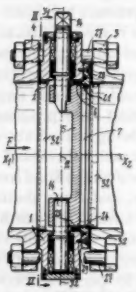
C. a waterproof film coating said pattern and bonded to said membrane immediately adjacent to the delineation of said pattern.

4,055,323

BUTTERFLY VALVE

Jean Gachot, 26 bis, Avenue de Paris, Soisy-sous-Montmorency, Val-d'Oise, France

Filed Feb. 12, 1976, Ser. No. 657,536
Claims priority, application France, Feb. 18, 1975, 75.04967
Int. Cl.[2] F16K *1/22*
U.S. Cl. 251—306 **2 Claims**



1. A butterfly valve having a body pierced by a passage designed to come into position opposite to two adjacent portions of a piping system, a valve closure disc mounted for

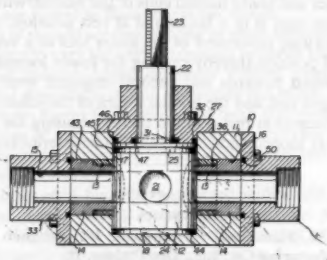
rotation within the valve passage about an axis which is transverse to said passage and displaced with respect to its axis of rotation, the valve disc having at its pheriphery an annular edge portion having a convex profile associated with an annular seal which is mounted so as to project within the valve passage, said seal comprising a removable metallic ring coated at least partially with plastic material, the ring having a substantially cylindrical plastic-coated metal mouthpiece mounted within one end portion of the valve passage, the internal surface of said mouthpiece being such as to have a profile which is flared in the direction of the axis of the valve disc whose peripheral edge portion is capable of bearing against said internal surface in fluid-tight manner, retaining means for maintaining the ring within said valve passage in a predetermined position with respect to said valve disc, said ring having an L-section profile metal radial flange integral with the mouthpiece and having a larger diameter than said mouthpiece, the two faces of said flange being capable of bearing in fluid-tight manner against the valve body at the end of the valve passage and against the flange of an adjacent pipe section, the metal mouthpiece of the metallic ring which is mounted within the valve passage being slotted to provide radial elasticity of said mouthpiece, an outer cylindrical surface of said metal mouthpiece being plastic coated and in fluid-tight contact with said one end portion of the valve passage.

4,055,324

PLUG VALVE ASSEMBLY

John F. Hughes, 91 d'Avignon, Dollard des Ormeaux, Quebec, and Stanislaw Dalkin, 3236 - 7th St., Chomedy, Quebec, both of Canada

Filed Apr. 29, 1976, Ser. No. 681,697
Int. Cl.[2] F16K *5/00*
U.S. Cl. 251—309 **7 Claims**



1. A plug valve assembly comprising:

a. a housing having aligned generally cylindrical inlet and outlet ports in the side walls thereof, a cylindrical valve chamber therebetween having its vertical axis normal to the axes of said ports and being closed by end walls;

b. generally cylindrical valve sealing members slidably mounted in the cylindrical walls of said ports, each said sealing member having a main body portion with a concave end face portion adjacent said valve chamber and an axial bore extending therethrough, said main body portion having an annular recess on the cylindrical surface thereof extending from said concave end to an annular abutment intermediate the length of said main body portion and a generally tubular resilient collar slidably mounted on the recessed portion of said main body, said collar having a thickness substantially equal to the depth of said recess and having a concave end portion protruding beyond the concave end of the main body portion by a distance of about 0.025 to 0.25 mm;

c. a cylindrical valve member having at least one transverse port therethrough positioned within said chamber with an annular gap of about 0.025 to 0.25 mm between the cylindrical valve member and the cylindrical wall of the valve chamber, said valve member being in resiliently sealing engagement with the concave end portions of the sealing member resilient collars, and resiliently supported for rotation by resilient valve seating and sealing members at the top and bottom regions of said valve member; and

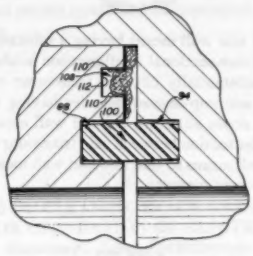
d. means to engage said valve member and rotate same while thus supported.

4,055,325

LUBRICANT POCKET FOR PRESSED IN GATE VALVE SEAT

Larry A. Vyvial, Richmond, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 14, 1976, Ser. No. 732,239
Int. Cl.[2] F16K *3/30*; B23P *17/00*
U.S. Cl. 251—328 **5 Claims**



3. A gate valve structure comprising a valve body having a valve chamber therein and an upstream flow passage communicating with the valve chamber, a gate valve mounted within the valve chamber for movement between open and closed positions, said valve body having an annular recessed portion about the upstream flow passage and a circumferential groove in the recessed portion facing the valve chamber, a generally cylindrical seal about the upstream flow passage and fitting within the recessed portion in face-to-face abutting contact with the recessed portion, and a deformable seal of an elongate cross-section positioned within said groove and filling between 80 and 100% of the total cross-sectional area of the groove, said seal upon being inserted within the groove being deformed when the seat is fitted in face-to-face abutting contact within the recessed portion to fill substantially the entire cross-sectional area of the groove, said seat having a relatively small annular channel in outer concentric relation to said relatively large circumferential groove to provide a lubricant pocket for lubricant forced along the inner peripheral surface defining the associated recess when the seat is pressed within the recess thereby to remove the lubricant from the adjacent recess surfaces and permit face-to-face abutting metal-to-metal contact between the seat and valve body without the seat being spaced from the body by a layer of lubricant.

4,055,326

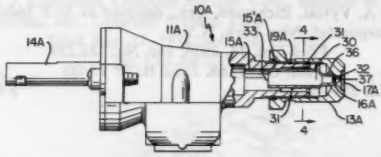
NEEDLE VALVE MEMBER FOR A CONTROL DEVICE AND METHOD OF MAKING THE SAME

William J. Sanders, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Feb. 25, 1976, Ser. No. 661,059
Int. Cl.[2] F16K *31/00*
U.S. Cl. 251—351 **12 Claims**

1. In a control device having a passage means provided with a valve seat for fuel flow therethrough and a needle valve member for cooperating with said valve seat for controlling the fuel flow therethrough while providing a minimum controlled fuel flow through said valve seat when said needle valve member is fully seated against said valve seat, the improvement wherein said needle valve member comprises a drawn one-piece elongated substantially cup-shaped member having tubular side wall means and a substantially flat end wall

means closing off one end of said tubular side wall means and being substantially transverse thereto, said end wall means being adapted to close against said valve seat and having an opening therethrough to cause said minimum flow through said valve seat when seated thereagainst, said cup-shaped member having said side wall means so arranged relative to said passage means that fuel is adapted to flow through said passage means and external of said side wall means to said



valve seat, said side wall means having a substantially triangular transverse cross-sectional configuration while said passage means has a substantially circular transverse cross-sectional configuration, said cup-shaped member having said side wall means stepped down adjacent said end wall means to define a reduced cylinder section between said triangular configuration and said end wall means so that said end wall means is cantilevered in said passage means.

4,055,327

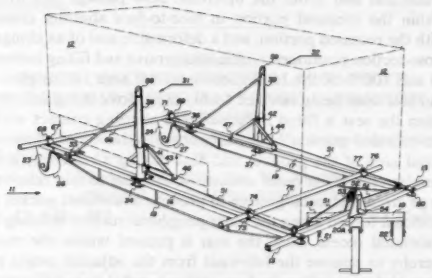
CAMPER LIFTER DEVICE

Henry R. Burgi, 1193 Florida St., Imperial Beach, Calif. 92032

Continuation of Ser. No. 620,946, Oct. 9, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 763,791

Int. Cl.[2] B66F *7/26*

U.S. Cl. 254—47 **2 Claims**



1. A lifter device for lifting and transporting campers comprising:

a frame having first and second side members and an end member, said first and second side members and end member being substantially co-planar, said end member being adjustably attached to said first and second side members;

first and second lifting assemblies slidably attached to said first and second side members, respectively, whereby said first and second lifting assemblies are forwardly and reversably adjustable to a camper carried thereon, said first and second lifting assemblies including first and second lifting bars, respectively;

a lifting cable assembly coupled to said first and second lifting bars and operable for raising and lowering said lifting bars on said lifting assembly; and

first and second structural members removably attached on top of said first and second side members, said first and second structural members being inwardly and outwardly adjustably secured and positioned for carrying said camper thereon.

4,055,328

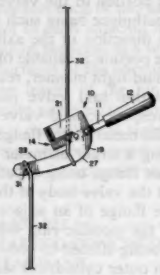
BALE-TIE JOINER TOOL

Emil Simich, Chicago, Ill., assignor to A. J. Gerrard & Company, Des Plaines, Ill.

Filed Nov. 5, 1976, Ser. No. 739,197

Int. Cl.[2] B66F *19/00*

U.S. Cl. 254—79 **8 Claims**



1. A bale-tie joiner tool for use in engaging and interlocking together the upper and lower pre-formed looped ends of the bale-tie wire extending around a compressed bale, including in combination:

elongated shaft means,

handle means mounted on one end of said shaft means, and

tool means mounted on said other end of said shaft means opposite said handle means, said tool means including bracket means having first and second tab members thereon extending forwardly of said other end of said shaft means, said second tab member being engageable with the upper and lower looped ends of the bale-tie wire when the joiner tool is in a horizontal at rest position, the pivotal clockwise movement of the joiner tool to a vertical actuated position thereby causing the lower looped end to be cammed towards and become engaged with the upper looped end, and the pivotal return of the joiner tool to the horizontal at rest position thereby causing the upper and lower looped ends of the wire to be interlocked together.

4,055,329

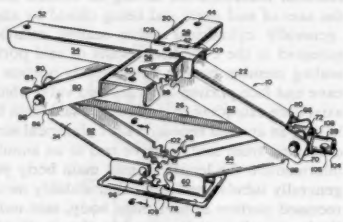
SCISSORS JACK

Grover M. Hammond, Streamwood, Ill., assignor to Leisure Manufacturing Co., Inc., Des Plaines, Ill.

Filed July 19, 1976, Ser. No. 706,787

Int. Cl.[2] B66F *3/00*

U.S. Cl. 254—86 R **9 Claims**



1. A scissors jack comprising:

a baseplate including a first channel-shaped member secured to said plate with the channel thereof opening upwardly of said plate;

means adapted to be mounted permanently to the bottom of a vehicle including a second channel-shaped member aligned substantially parallel with said first channel-shaped member and having its channel opening down-

wardly towards the baseplate, said mounting means including

a third and a fourth channel-shaped member having their channels opening downwardly, secured to opposite sides of said second channel-shaped member and aligned with one another substantially normal to said second channel-shaped member;

opposed pairs of channel-shaped scissors arms vertically aligned with said channel-shaped members and each pair of said arms being hingedly secured together at one end thereof to form a pivot point, the ends of each pair opposite its pivot point having teeth formed therein, the teeth of the upper arms being intermeshed and the upper arms being hingedly connected to said second channel-shaped member, and having their channels opening downwardly, the teeth of the lower arms being intermeshed and the lower arms being hingedly connected to said first channel-shaped member and having their channels opening upwardly, the toothed ends of the upper arms being disposed for pivotal movement within the channel of the second channel-shaped member and the toothed ends of the lower arms being disposed for pivotal movement within the channel of the first channel-shaped member;

a bushing mounted for limited swinging movement at one pivot point and a nut mounted for limited swinging movement at the other pivot point;

a threaded rod extending between the pivot points and journaled in the bushing for free rotation therein while threadedly engaging in the nut;

means for rotating the rod;

means for preventing axial movement of the rod relative to the bushing, the length of the rod being greater than the distance between pivot points when the scissors arms are closed to their maximum extent;

means for protecting said threaded rod when said scissors arms are closed to their maximum extent;

rotation of the rod serving to open or close the scissors arms whereby to vary the vertical spacing between the first and second channel-shaped members without changing the parallel disposition of one relative to the other;

engagement means for keeping said teeth intermeshed at all positions of said scissors arms and for relieving stress on said hinged connections of said first and second channel-shaped members;

said scissors arms hingedly connected within said first and second channel-shaped members by oppositely positioned pairs of individual pin means, each engaging one side of the hingedly connected scissors arms; and

said engagement means including straps secured between opposite ones of each pair of pin means in said first and second channel-shaped members.

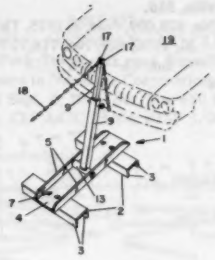
4,055,330

LIFTING DEVICE FOR RAISING AND FREEING STUCK VEHICLES

Donald A. Chapman, 14997 S. Furrow Road, Larkspur, Colo. 80118

Filed Mar. 15, 1977, Ser. No. 777,823
Int. Cl.[2] B66F 3/00
U.S. Cl. 254—131 **6 Claims**

1. A lifting device for raising and freeing stuck vehicles comprising a pair of relatively wide flat spaced channeled supporting plates, a relatively wide flat channeled base plate spanning and removably interconnected to said supporting plates, an elongated square shaped tubular lever, a square shaped upper section telescopically received in said lever, a transverse tubular bearing on the lower end of said lever, said bearing positioned on said base plate and receiving hinge pin means therein for pivotally connecting said lever thereto, means on the upper end of said upper lever section for receiving a towing chain therethrough for connection to a vehicle to be raised and towed, whereby a pull exerted on said chain will pivot said lever upwardly to raise and free the vehicle and thereafter cause said lever to collapse forwardly to disengage



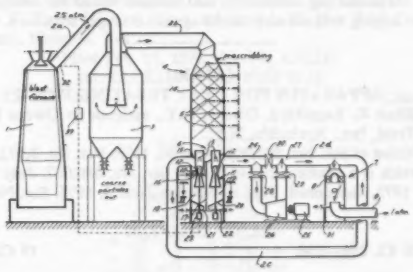
said chain and permit continued uninterrupted forward travel of the vehicle.

4,055,331

METHOD OF CLEANING STACK GAS AND USING SAME FOR GENERATION OF ELECTRIC POWER

Karl-Rudolf Hegemann, Essen-Bergerhausen, Germany, assignor to Gottfried Bischoff Bau Kompl. Gasreinigungs und Wasserruckkuhlanlagen Kommanditgesellschaft, Essen, Germany

Continuation-in-part of Ser. No. 520,920, Nov. 4, 1974, Pat. No. 4,007,025. This application June 4, 1976, Ser. No. 692,731
Claims priority, application Germany, Nov. 6, 1973, 2355457; Aug. 20, 1974, 2439758; Aug. 20, 1974, 2439757
Int. Cl.[2] C21B 7/22
U.S. Cl. 266—44 **4 Claims**



1. A method of cleaning stack gas under pressure from a blast furnace, said method comprising the steps of:

continuously collecting said gas at said furnace;

removing particulate material from said gas; thereafter washing the collected gas;

thereafter passing a portion of the washed collected gas through a variable cross section annular-gap washer and passing the remainder of said gas through another annular-gap washer and directly thereafter through an expansion turbine, said remainder of said gas driving said turbine;

varying the flow cross section of said variable annular-gap washer in accordance with the pressure of said gas at said blast furnace so as to maintain said pressure constant, said variable annular-gap washer constituting the sole controller of the back pressure of said blast furnace;

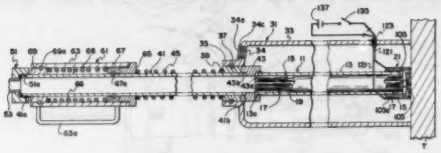
driving an electric generator with said turbine; and

combining said portion and said remainder of said gas downstream of said washers and said turbine.

4,055,332
CUTTING TORCH ARRANGEMENT

Patrick E. Sweeney, Baltimore, Md., assignor to AAI Corporation, Cockeysville, Md.

Division of Ser. No. 628,009, Nov. 3, 1975. This application Aug. 30, 1976, Ser. No. 718,717
Int. Cl.[2] B23K 7/10
U.S. Cl. 266—48 12 Claims

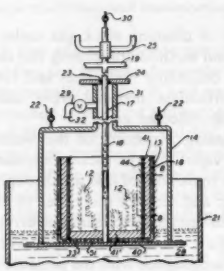


1. A cutting torch arrangement comprising
a thermal bar comprising a burner pipe having combustible rod-like elements extending along a length thereof, with longitudinal gas passageways formed therebetween for feeding of oxygen gas along the interior of said pipe and enabling igniting and burning of one end of said thermal bar,
and a protective annular shroud/shield longitudinally movably disposed over and along the forward ignitable end of said burner pipe,
said shroud/shield having an open forward end,
means for moving said burner pipe forwardly within and toward said open end of said shroud/shield as said bar is burned at said one end,
a feed pipe,
securing means for removablyy securing said burner pipe to said feed pipe in gas flow-enabling relation,
said feed pipe slidable and within and along said shroud/-shield, said securing means being disposed within said shroud/shield,
and a compression spring disposed longitudinally of said burner pipe and having its forward end acting in force-transmitting relation to said shroud/shield for resiliently urging said shroud/shield against a target structure.

4,055,333
APPARATUS FOR HEAT TREATING WORK

William E. Engelhard, Owego, N.Y., assignor to Owego Heat Treat, Inc., Apalachin, N.Y.

Division of Ser. No. 592,040, June 30, 1975, Pat. No. 3,972,751, which is a continuation-in-part of Ser. No. 380,067, July 17, 1973, abandoned. This application June 4, 1976, Ser. No. 682,491
Int. Cl.[2] C21D 1/62
U.S. Cl. 266—130 19 Claims

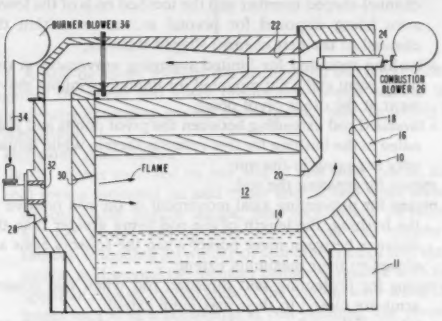


1. In an apparatus for cooling work which has been preheated and positioned in a work holder;
quenching medium means proportioned to freely receive said work holder therein,
means for positioning said work holder in said quenching medium means,
said work holder including a wall apertured for flow of said quenching medium therethrough and onto the work in said work holder, to cool said work,
a plurality of heat exchange units, and
means so positioning said units on said wall, whereby, on positioning said work holder and work in said quenching medium, said medium will flow through said apertured wall of said work holder and onto and around said heat exchange units and into the work holder and onto said work, and cooling the same.

4,055,334
RECYCLE BURNER SYSTEM

Wilbur E. Stephens, Redwood City, Calif., assignor to Alumax Inc., San Mateo, Calif.

Filed Feb. 9, 1976, Ser. No. 656,265
Int. Cl.[2] F27B 3/22
U.S. Cl. 266—138 4 Claims



1. An improved furnace of the type having a closed furnace chamber for containing a bath of molten metal, the furnace chamber having a main burner port, and burner means for establishing a flame path over the bath of molten metal by admitting fuel and oxygen to the interior of the chamber through the main burner port wherein the improvement comprises burner means which introduces both fuel and only a portion of the oxygen requirement for total combustion of the fuel, a passage external to the furnace chamber for recycling exhaust gases from the furnace chamber back to the main burner port, and eductor means for introducing the additional oxygen necessary for complete combustion into the recycling passage under pressure and in a direction to propel the exhaust gases in the recycling passage towards the main burner port, whereby the oxygen added into the recycling passage by the eductor means is preheated by mixing with the furnace chamber exhaust gases and the flame path is lengthened.

4,055,335
TRANSFORMATION OF TOP-BLOWN STEEL CONVERTER VESSEL TO BOTTOM-BLOWN TYPE

Howard M. Fisher, New Castle, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

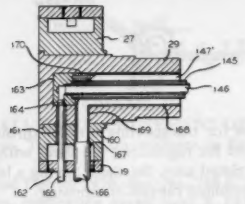
Division of Ser. No. 261,823, June 12, 1972, Pat. No. 3,810,297. This application Feb. 1, 1974, Ser. No. 438,586
Int. Cl.[2] C21C 5/46, 5/50
U.S. Cl. 266—245 2 Claims

1. For metallurgical apparatus including a vessel, trunnion ring means supporting said vessel and trunnion pin means extending from said ring means to enable tilting of said vessel, at least one of said trunnion pin means having an axial bore, improved means for communicating fluids with said apparatus, comprising:
a. adapter means in said axial bore of said pin means, said adapter means having a first bore that is generally axial of

said adapter means and of said pin means and also having an first generally radial bore communicating with said axial bore, and said radial bore also being in substantial registry with a generally radial hole in said pin means,

b. a first tubular element extending into said axial bore of said pin means and terminating in registry with and sealably with the axial bore of said adapter means, said first tubular element being rotatable with said adapter means and with said trunnion pin means when said vessel is tilted,

c. said radial hole in said pin means enabling a continuous fluid flow path through said radial hole, said adapter means and said first tubular means,



d. tubular sheath means for protecting said first tubular element against erosion, said tubular sheath means surrounding said first tubular element and being sealingly joined with said adapter means so as to close the end of the space between said inner first tubular means and said tubular sheath means,

e. the outside of said tubular sheath means defining with the inside of said trunnion pin axial bore a passageway for selectively transporting fluids such as gas, gas which entrains finely divided materials and coolant,

f. said trunnion pin means having a hole leading generally radially from said passageway to provide a path for conducting fluid through said pin means to or from said apparatus.

4,055,336

LINING SLABS

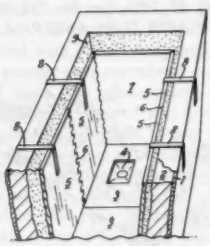
Daniel Maurice Massin, Donchery, France, assignor to Foseco Trading A.G., Chur, Switzerland

Filed Oct. 22, 1976, Ser. No. 735,214

Claims priority, application United Kingdom, Nov. 10, 1975, 46434/75

Int. Cl.² C21C 7/00

U.S. Cl. 266—283 **5 Claims**



1. A container for molten metal having a floor and sidewalls and having an inner wall lining made up of a plurality of slabs of refractory heat insulating material having generally vertically generally planar major faces, at least some of the slabs having two opposite edges castellated, said castellated edges including a plurality of teeth with slots defined between the teeth, said slots extending from one major slab face to the other, with interengaging castellation teeth forming the joints between the slabs, all joint faces of the castellation teeth not lying in vertical planes slope downwardly away from the interior of the molten metal container.

4,055,337

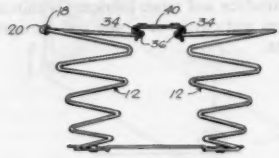
SPRING ASSEMBLY AND CLIP

Emile J. Laiche, Park Forest, Ill., and Russell E. Jones, Hialeah, Fla., assignors to Nachman Corporation, Des Plaines, Ill.

Filed Sept. 4, 1975, Ser. No. 610,107

Int. Cl.² A47C 23/04; F16F 3/04

U.S. Cl. 267—101 **4 Claims**



4. A spring clip formed of an integral flat metal strip having a central body portion, portions extending from the ends of the body portion in sequence in a reverse bent portion and an inwardly extending portion spaced below the body portion to provide opposite inwardly facing channels, a reversely bent portion and outwardly extending portion spaced below the inwardly extending portion to provide opposite outwardly facing channels, a projection near the end of the outwardly extending portion extending in the direction of the inwardly extending portion to decrease the spaced relation therebetween, and a tongue extending curvilinearly downwardly and outwardly from the end of the outwardly extending portion, and a rib extending lengthwise along the body portion into the inwardly facing channels to restrict the passage therein.

4,055,338

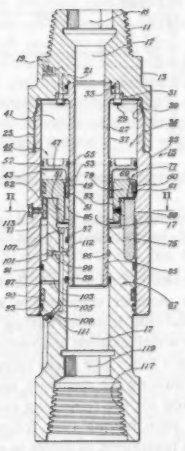
DRILL STRING SHOCK ABSORBING APPARATUS

Billy F. Dyer, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Feb. 17, 1976, Ser. No. 658,217

Int. Cl.² E21B 17/02; F16F 9/18

U.S. Cl. 267—125 **9 Claims**



1. In a shock absorbing apparatus for use in a drill string, including a tubular body adapted to be secured to a drill string member; a mandrel reciprocally mounted to the tubular body for rotation therewith and and having a portion adapted to be

secured to another drill string member; drilling fluid passage means within the tubular body and the mandrel for the passage of drilling fluid; and an annular sealed chamber within the tubular body above the mandrel containing pressurized fluid for absorbing load and shock, the improvement which comprises in combination:

annular and axially spaced seals between the mandrel and a lower portion of the tubular body to define a lubricant cavity sealed from the chamber to lubricate said seals;

lubricant passage means for supplying lubricant from an exterior source to said lubricant cavity;

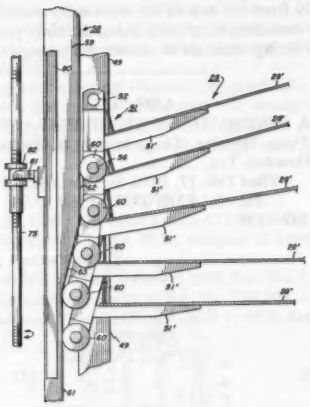
and grease fitting means communicating with said lubricant cavity to introduce and retain lubricant within said lubricant passages and cavity at a selected pressure greater than ambient.

4,055,339

SORTER APPARATUS

John H. Looney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 27, 1977, Ser. No. 763,276
Int. Cl.[2] B65H *39/10*
U.S. Cl. 271—173 **3 Claims**



1. Improved sorting apparatus comprising:

a frame;

a plurality of bin members arranged in a vertical array supported for sliding and pivotal movement relative to said frame;

means for moving said bin members relative to said frame;

an elongated cam member coextensive with the vertical array of bins, said cam member having a predetermined camming profile which extends in a vertical direction then inclines to define a ramp at a sheet entering station associated with said moving bin members, and then extends in a vertical direction for the remaining extent thereof;

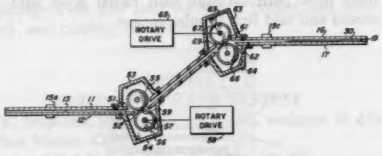
said bin members each having cam follower means associated therewith positioned to move in contact with said cam member whereby as each of said bin members is moved past the sheet entering station pivotable movement to imparted thereto to effect spreading movement between said bin members thereat.

4,055,340

ASSISTED PNEUMATIC TRANSPORT AND REGISTRATION APPARATUS

Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1975, Ser. No. 636,334
Int. Cl.[2] B65H *29/24*
U.S. Cl. 271—236 **14 Claims**



1. Apparatus for transporting a sheet through at least one curved path and for registering the sheet with respect to perpendicularly related axes, the sheet having a length and width within predetermined ranges, comprising:

a. a sleeve for internally accomodating said sheet, said sleeve extending along the curved path, at least one point on an inner narrow wall of the sleeve being aligned in parallel with one of the axes;

b. a stop located at one end of the sleeve, the stop having at least one point aligned in parallel with the other of the axes;

c. means for guiding the sheet past corners of said at least one curved path; and

d. means for providing in the sleeve a fluid stream having velocity components normal to each of the axes, whereby when a sheet is placed in the sleeve the stream moves the sheet into said means (c) and into abutment with each of said points;

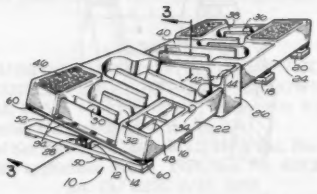
said means for guiding including a first opening at a corner of a curved path in the top wide wall of the sleeve, a second opening, located opposite the first opening on the bottom wide wall of the sleeve, a first rotatably mounted roller extending into the sleeve through one of the openings, a second rotatably mounted roller extending into the other opening of the sleeve and engaging the first roller to provide a nip, and means for driving one of the rollers.

4,055,341

TILTING MAZE RACE GAME

Daniel G. Martinez, Sylmar, Calif., assignor to Gilbert Sacks Enterprises, Inc., El Monte, Calif.

Filed Aug. 13, 1976, Ser. No. 714,056
Int. Cl.[2] A63B *71/04;* **A63F** *9/14*
U.S. Cl. 273—86 C **11 Claims**



1. A game apparatus for use by at least two players simultaneously comprising:

a. a base member;

b. first and second platforms pivotally engaging said base member in spaced apart relationship thereon, each of said platforms defining a tortuous path through which a ball may travel; and

c. a ball receiving member fixedly mounted upon said base

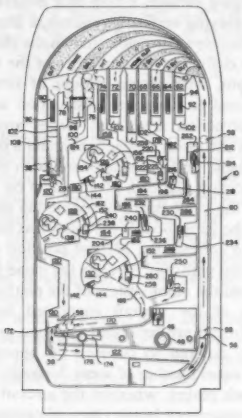
between said platforms and defining first and second openings therein, said first opening aligning with the tortuous path in said first platform and the second opening aligning with the tortuous path in said second platform, the lowermost part of said first opening and the surface of said tortuous path in said first platform are aligned only when said first platform is in a predetermined tilted position and the lowermost part of said second opening and the surface of said tortuous path in said second platform are aligned only when said second platform is in a predetermined tilted position.

4,055,342

BASEBALL GAME AMUSEMENT DEVICE

Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1976, Ser. No. 748,677
Claims priority, application Japan, Sept. 8, 1976, 51-107396
Int. Cl.² A63F *7/06*
U.S. Cl. 273—88 **10 Claims**



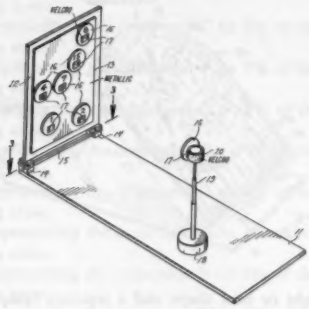
9. In a baseball game amusement device of the type having a mechanism for propelling balls within a casing into a target are provided with indicia corresponding to the various functions performed during the playing of baseball, and a baseball diamond provided with indicia designating first, second, and third bases and passageways operatively connecting said target zones and said bases, the improvement comprising a plate member associated with each of said first, second and third bases, means mounting said plate to said casing to rotate between a first position wherein indicia thereon is exposed to the view of the player indicating that said base is occupied and a second position wherein said indicia is not exposed to view, means provided on said plate for catching one of said balls causing said plate to move from said second position to said first position, and an actuating member associated with each of said plates, each having means mounting said actuating member to said casing for rotation, a first rod extending from said actuating member to a position preventing a ball from leaving said means for catching said balls when its associated plate is in said first position, and rod means extending into said passageways which when contacted by a ball passing therethrough causes said actuating member to rotate moving said first rod permitting a ball to leave said means for catching said balls provided on said plate.

4,055,343

SURFACE PROJECTILE GAME APPARATUS

Edwin G. Stuart, 308 Patterson Lane, Florissant, Mo. 63031

Filed May 21, 1976, Ser. No. 688,742
Int. Cl.² A63F *9/14*
U.S. Cl. 273—108 **9 Claims**



1. A game apparatus comprising, in combination, an elongated horizontal game playing surface, a game board having an adherent surface, support means at one end of said game playing surface supporting said game board in a substantially vertical plane such that said adherent surface is facing in the direction of the other end of said game playing surface, a rebound means; said rebound means being affixed between at least two points at said one end of said game playing surface immediately in front of, near, and across the base of said game board, a game piece transporter; said game piece transporter having a substantially flat bottom surface and a shaft extending substantially vertically upward therefrom, said shaft having a vertically adjustable adherent means mounted thereon, a game piece having opposite sides; said game piece having adherent means on one of its sides permitting releasable affixation to said adherent surface on said game board and adherent means on the side opposite said one side permitting releasable affixation to said adherent means mounted on said shaft; the adherence between said adherent means on said game board and said one side of said game piece being greater than the adherence between the adherent means on said shaft and said adherent means on said side opposite said one side of said game piece such that when said game piece is attached to said adherent means on said shaft and said game piece transporter is propelled from said other end of said game playing surface and into said rebound means said game piece will be deposited upon said game board adherent surface as said game transporter is rebounded towards said other end of game playing surface of said rebound means.

4,055,344

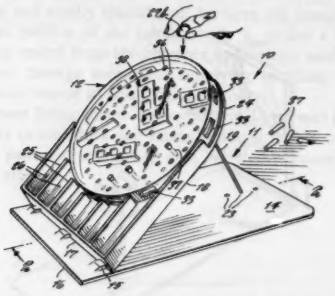
ROTATING MAZE GAME DEVICE

Claude Soucie, 6807 60th St., Ridgewood, N.Y. 11227

Filed May 14, 1976, Ser. No. 686,458
Int. Cl.² A63B *71/04*; A63F *5/02, 7/02*
U.S. Cl. 273—110 **2 Claims**

1. A rotating maze game device, comprising in combination, an easel, a rotatable maze supported pivotally thereupon, and playing pieces for travel through said maze; wherein said easel comprises a horizontal base panel, an inclined panel supported at an inclined angle upon said base panel by means of a brace, and means for adjusting said inclined angle; wherein said maze comprises a circular housing supported pivotally free at the center upon a pivot secured upon said inclined panel, said housing comprising a case and transparent cover that snap fit together for easy opening, to form a central compartment, side walls of said case and cover having aligned openings serving as entrances and exits for said playing pieces, and aligned open-

ings in upper and lower sides of said housing for supporting obstructions in selective positions inside said housing compartment for said playing pieces; wherein certain said obstructions comprise adjustable taper pins; wherein other of said obstructions comprise houses each of which consists of a side wall of



any straight or bent shape and a separate opaque top wall having window openings therethrough, a lower edge of said house side walls having downward extending pegs for insertion into said opening through said lower side of said housing, while said opaque top wall is adherred to an underside of said housing top wall.

4,055,345

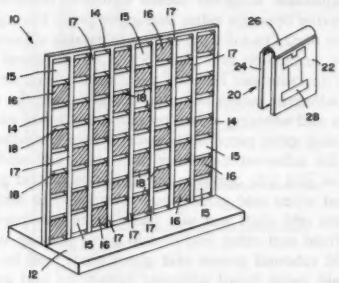
GAME APPARATUS

Vaclav Havlik, 888 Foster City Blvd., Foster City, Calif. 94402

Filed Oct. 23, 1975, Ser. No. 625,185

Int. Cl.[2] A63F *3/02*

U.S. Cl. 273—131 AC **13 Claims**



1. Game apparatus comprising in combination a game board of given area and thickness and having opposed substantially parallel major surfaces, a plurality of individual slots through said game board defining a given number of playing fields arranged with respect to each other in a planar array of rows and columns of given areas of the opposed major surfaces of said game board, said major surfaces of said playing fields each having an area less than said given area of said array divided by said given number of said playing fields, material disposed between and interconnecting all adjacent corners of said playing fields in said array; and a plurality of game pieces each comprising a pair of indicia bearing bodies, the indicia on a respective one of said pair of indicia bearing bodies of each game piece being the same as the indicia on the respective other one of said pair of indicia bearing bodies of said game piece, and means joining said bodies to each other at one of their ends, said means joining said bodies of each of said game pieces allowing said bodies to extend in mutually parallel planes spaced from each other by a distance at least equal to and not much greater than said given thickness of said game board, at least one of the material forming said interconnected adjacent corners of said playing fields in said array, said means joining said pair of indicia bearing bodies of each of said plurality of game pieces and said plurality of playing fields being flexible.

4,055,346

TABLE WAR GAME APPARATUS

Marcos García-Kuenzli, P.O. Box 2212, Hato Rey Station, San Juan, P.R. 00919

Filed Apr. 5, 1976, Ser. No. 673,469

Int. Cl.[2] A63F *3/04*

U.S. Cl. 273—131 BB **7 Claims**

3. A game device comprising a game board having a generally planar playing surface, a map of a geographical area depicted on said playing surface by indicia, a plurality of irregularly-shaped discrete areas delineated on the playing surface by perimeter lines defining the boundaries of the areas, said areas being contiguous, with certain groups of areas being distinguishably colored to designate obstruction areas and target areas, the obstruction areas and target areas representing mountain areas and cities, respectively, and a plurality of game pieces positionable on the game board with each game piece having a supporting platform positionable on the various discrete areas on the game board to enable the game pieces to be moved along the game board, the platforms being distinguishably colored to indicate the vertical position of a game piece supported by that platform, wherein the game pieces are miniature aircraft, and the color system of the platforms indicate the flight altitude of the aircraft supported by the platform, wherein the aircraft are separated into two groups which are distinguishably colored to be used by opponents playing a game with an equal number of areas designated as cities being assigned to each player, whereby the aircraft may attack the aircraft of opponents or bomb cities of opponents by maneuvering aircraft to change altitude by utilizing differently colored platforms and by moving from area to area during each player's turn in which a predetermined number of actions may be taken by each aircraft, and a measuring device means for determining whether an attacking aircraft has properly approached an attacked aircraft by determining whether the distance between the area of the attacking aircraft and the area of the attacked aircraft is between a first and a second distance, and for determining whether a missile fired by the attacking aircraft hits or misses the attacked aircraft by determining whether the distance between the area of the attacking aircraft and the area of the attacked aircraft is between said first distance and a third distance which is between the first and second distances.

4,055,347

BOARD GAME APPARATUS

Lois A. Kreischer, 8 Indian Trail Court, Novato, Calif. 94947

Filed June 24, 1976, Ser. No. 699,350

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—135 D **9 Claims**

1. Game apparatus comprising:

a game board;

a track on said game board having a series of spaces forming

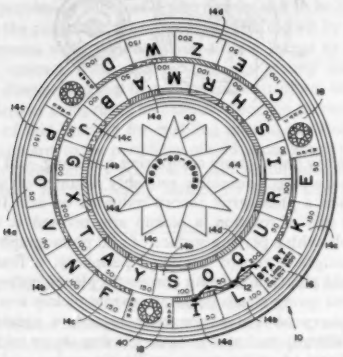
a continuous path along which a game piece is moveable in increments;

each of certain of said track spaces representing a letter of the alphabet;

a plurality of marker tiles, each having thereon a letter of the alphabet and indicia of a monetary value assigned to that letter, there being at least two groups of letter tiles valued in accordance with the frequency of their appearance in words of a language;

a second playing board for each player;

each second playing board having delineated thereon a limited number of horizontal and vertical rows of spaces for placement of said tiles thereon by said each player;



at least two dice each with numbering indicia on the sides thereof to be thrown so that moves along said track may be made, selectively, at the election of the player throwing, in increments corresponding to the numbers thrown, taken separately or as sums thereof; and

a quantity of play money for rewarding the formation on said second playing board of complete words from letters on said tiles as indicated by the sum of the monetary values thereon;

each complete word so formed to be horizontally and vertically spaced from others on the limited spaces of a player's own second playing board unless horizontal and vertical words are linked by a common letter.

4,055,348

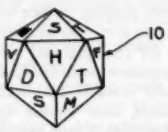
WORD BUILDING GAME

Pettersen B. Marzoni, Jr., P.O. Box 11598, Aspen, Colo. 81611

Filed Oct. 10, 1975, Ser. No. 621,340

Int. Cl.[2] A63F 9/04

U.S. Cl. 273—146 **3 Claims**



1. Game apparatus comprising a chance device having five chance elements, the chance device including means defining a plurality of indicia-bearing areas, each chance element having twenty indicia-bearing areas, a set of indicia characters having a distinct character for representing each consonant of the English alphabet, there being at least one indicia character on each of said discrete indicia-bearing areas as follows:

indicia representing the consonant R on 12% of the indicia-bearing areas,

indicia representing the consonant T on 11% of the indicia-bearing areas,

indicia representing the consonant N on 11% of the indicia-bearing areas,

indicia representing the consonant L on 9% of the indicia-bearing areas,

indicia representing the consonant S on 9% of the indicia-bearing areas,

indicia representing the consonant D on 9% of the indicia-bearing areas,

indicia representing the consonant C on 6% of the indicia-bearing areas,

indicia representing the consonant P on 5% of the indicia-bearing areas,

indicia representing the consonant G on 5% of the indicia-bearing areas,

indicia representing the consonant M on 5% of the indicia-bearing areas,

indicia representing the consonant H on 4% of the indicia-bearing areas,

indicia representing the consonant F on 3% of the indicia-bearing areas,

indicia representing the consonant B on 3% of the indicia-bearing areas,

indicia representing the consonant W on 2% of the indicia-bearing areas,

indicia representing the consonant V on 2% of the indicia-bearing areas,

indicia representing the consonant K on 2% of the indicia-bearing areas,

indicia representing the consonant X on 1% of the indicia-bearing areas,

and indicia representing the consonants J, Q and Z on 1% of the indicia-bearing areas.

4,055,349

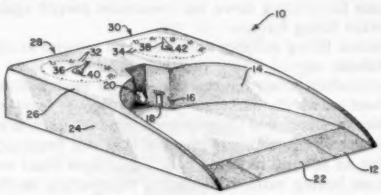
GOLF PUTTING PRACTICE DEVICE HAVING MECHANICAL CALCULATORS

Archie F. Hunt, Rte. 2 Box 140, Marietta, S.C. 29661, and Jack J. Moss, 640 Ardeleigh Drive, Akron, Ohio 44303

Filed Apr. 21, 1976, Ser. No. 679,061

Int. Cl.[2] A63B 69/36

U.S. Cl. 273—179 A **10 Claims**



1. A device for aiding one in improving his golf putting skill, comprising:

a wall having a receptacle therein and partially encompassing an arcuate bottom surface, said bottom surface having a depressable tongue positioned at a front portion thereof;

a first mechanical counter comprising a first ratchet wheel and pawl assembly; and

a mechanical linkage comprising a lever arm operatively connected at one end to said tongue and having a first beveled surface at the other end thereof, said pawl having a second beveled surface thereon in juxtaposition to said first beveled surface, depression of said tongue actuating said counter via said linkage.

4,055,350

CHANGER PIN FOR A RECORD CHANGER

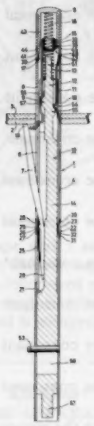
Robertus Jozefus Maria Verhoeven, and Daniel Ong, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 15, 1976, Ser. No. 677,211

Claims priority, application Netherlands, May 7, 1975, 7505356

Int. Cl.[2] G11B *17/04*

U.S. Cl. 274—10 S 4 Claims



3. A changer spindle for a record changer having a changer mechanism suitable for changing and completely independently supporting a plurality of phonograph records comprising:

a cylindrical sleeve having at least three axially extending lifter slots therethrough, circumferentially spaced at a same axial location, and an upper end;

an end cap;

means connecting said end cap to said sleeve at said upper end;

a single control slide mounted within said sleeve; means responsive to axial position of said slide for supporting a stack of phonograph records on said sleeve from below a lowermost record of the stack, and for withdrawing said support;

means for holding down the lowermost record against upward lifting force,

a record lifting member comprising an integral axially split tubular record lifting ring having at least three axially extending lifting fingers, said fingers having distal ends bent outwardly and arranged to project at least into said sleeve slots, said fingers each having an intermediate inwardly projecting portion, at least one finger comprising an integral blocking cam adjacent its distal end, said cam having surfaces extending transversely to the axial direction of said finger, a respective slot in said sleeve has a locally widened portion at the location of said cam, said finger being in a lowered position;

a movable ring support clamped within said split ring;

said single control slide having means for operatively controlling said record hold-down means in response to axial position of said slide, an upper end of said slide engageable upon initial axial motion with said ring support means for positioning said blocking cam in said locally widened portion in the absence of a record on said support means whereby upon axial movement of said slide during a changing cycle, engagement of the upper end of said slide with said ring support prevents further movement of said slide; and comprising

a spring urging said ring support away from said upper end of said slide; and

means for biasing said ring support away from said end cap.

4,055,351

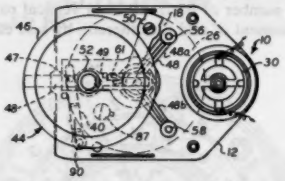
RESETTABLE TOY PHONOGRAPH

Alexander W. Hughes, Jr., 19 Wardell Circle, Oceanport, N.J. 07757

Filed Dec. 6, 1976, Ser. No. 747,485

Int. Cl.[2] G11B *17/06;* A63H *3/33*

U.S. Cl. 274—15 R 17 Claims



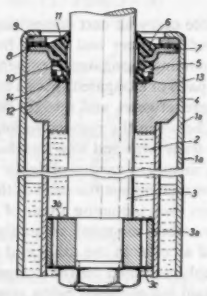
17. In a toy phonograph comprising a housing, said housing comprising a base, a turntable rotatably mounted on said base for rotation a phonogrph record mounted on said turntable about an axis of rotation, a pickup arm pivoted at one end engageable with a playing surface of said phonograph record, said phonograph record having a periphery, a first spring means, said pickup arm being constantly placed under a force of said first spring means which urges said pickup arm toward the periphery of said phonograph record, a speaker cone means resiliently mounted on said housing above said pickup arm, and second spring means resiliently urging said speaker cone means into contact with said pickup arm with a biasing force for pressing said pickup arm into engagement with said phonograph record for reproducing recorded sound from said phonograph record playing surface; the improvement comprising a first cam means axially mounted on said turntable axis of rotation and fixedly rotatable therewith, a second cam means nestable with said first cam means for rotation therewith when in nested engagement therewith, said second cam means being a floating cam means comprising at least one lower peripheral cam surface sloped with respect to said turntable, said first cam means having at least one congruent upper peripheral cam surface nestable with said second cam means at least one peripheral cam surface, third spring means resiliently urging said second floating cam means at least one lower peripheral cam surface into nesting engagement with said first cam means at least one upper peripheral cam surface, said second floating cam means comprising a first protrusion extending outwardly therefrom beneath said speaker cone means parallel to said phonograph record playing surface and being normally biased out of engagement with said speaker cone means by said third spring means, said pickup arm comprising a second protrusion extending upwardly therefrom substantially normal to said phonograph record playing surface and being pivotally movable with said pickup arm, said speaker cone means comprising a lift bar means for enabling said speaker cone means to be urged out of engagement with said pickup arm by said second cam means as said nestable cam surfaces are driven out of nesting engagement, said second spring means resiliently urging said lift bar means into supporting contact with said pickup arm second protrusion, said lift bar means comprising a third protrusion extending downwardly therefrom substantially normal to said phonograph record playing surface and normally disposable above said rotating first protrusion when said lift bar means is in said supporting contact with said pickup arm second protrusion, said second protrusion being pivotally movable with said pickup arm, said lift bar means further comprising means to drop said lift bar towards said phonograph record when said pickup arm is adjacent the end of said phonograph record recording, causing said first and third protusions to engage halting rotation of said second floating cam means, said turntable and said first cam means still

being rotatable when said first and third protrusions are in engagement, said rotating first cam means at least one upper peripheral cam surface being driven out of nesting engagement with said second cam means at least one lower peripheral cam surface during rotation of said turntable when said first and third protrusions are in engagement, said second cam means at least one sloped lower peripheral cam surface rising up said at least one sloped first peripheral cam surface as said cam surfaces are driven out of said nesting engagement to enable sufficient contact of said second cam means with said speaker cone means to overcome said second spring means biasing force and urge said speaker cone means out of engagement with said pickup arm to raise said lift bar means above said second protrusion and enable said pickup arm to be resiliently reset to the periphery of said phonograph record by said first spring means while returning said lift bar means to said supporting contact with said pickup arm second protrusion, thereby disengaging said first and third protrusions, said lift bar means further comprising an extension portion thereof extending out of said housing for enabling manual resilient reset of said pickup arm to the periphery of said phonograph record by said first spring at any position of said pickup arm along said phonograph record playing surface by lifting said extension portion.

4,055,352
SEALING MEANS FOR A LONGITUDINALLY DISPLACEABLE ROD

Fernand Michel Allinquant, 53, Avenue Le Notre, and Jacques Gabriel Allinquant, 12, Avenue Arouet, both of 92330 Sceaux, France

Filed Apr. 13, 1976, Ser. No. 676,512
Claims priority, application France, Apr. 18, 1975, 75.12133
Int. Cl.² F16J *15/32*
U.S. Cl. 277—152 **3 Claims**



1. A sealing device for maintaining a liquid seal for a rod mounted in a liquid containing chamber, comprising:

gland means, wherein said gland means is configured to define a concentric cavity;

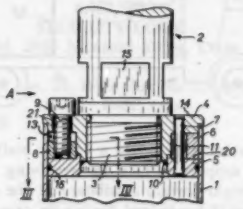
a resilient sealing element having a main body portion of generally cylindrical form having at one end thereof a relatively short cylindrical skirt which, in use, is bent or turned back to define an annular chamber surrounding one end of said main body portion, and wherein the main body portion has a barrel-shaped inner surface and the skirt is connected to the main body portion by an outwardly flared portion, said main body portion further including an annular inwardly entending lip at a second end thereof remote from said skirt and an annular inwardly extending rib intermediate said lip and said skirt, wherein said lip and said rib have approximately equal normal diameters; and

flange means for retaining said sealing means in a fixed position with respect to said gland means and said chamber, wherein said skirt of said sealing means is curved outwardly with respect to said rod and forms an annular chamber within said cavity.

4,055,353
CLAMPING DEVICE, ESPECIALLY FOR ROCK OR CONCRETE DRILLS

Hans Bieri, Pfaeffikon, Switzerland, assignor to Hydrostress Aktiengesellschaft, Pfaeffikon, Switzerland

Filed Aug. 16, 1976, Ser. No. 714,772
Claims priority, application Switzerland, Aug. 19, 1975, 10765/75
Int. Cl.² B23B *27/00*
U.S. Cl. 279—2 R **9 Claims**

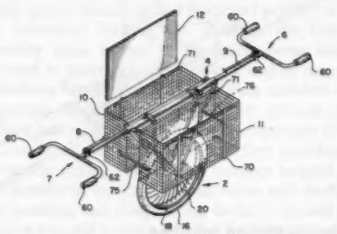


1. A clamping device for releasably connecting a drive member in a force transmitting manner to a tubular drive member, comprising a centering means concentrically fitting into said tubular drive member, means securing said drive member to said centering means, a ring space in said centering means, clamping ring means located in said ring space, axially extending slot means in said clamping ring means, wedging means axially shiftable in said slot means, clamping screw means cooperating with said wedging means to shift the latter in said slot means whereby said clamping ring means is forced to expand radially outwardly against the inner surface of said tubular driven member when said clamping screw means is tightened.

4,055,354
HIKERS CART

Donald M. Sharpe, 18962 Chadbourne Lane, Santa Ana, Calif. 92706

Filed Aug. 4, 1976, Ser. No. 711,659
Int. Cl.² B62B *1/20*
U.S. Cl. 280—47.31 **13 Claims**



1. A device for transporting a load comprising:

a single wheel;

an elongated frame disposed directly over the wheel and extending forward and rearward of said wheel;

means extending down from said frame alongside said wheel mounting said frame on the wheel for travel therewith;

said mounting means extending no more than about several inches laterally of said wheel;

handle means at each end of the frame for use by two persons to direct and propel the wheel;

a pair of containers mounted on said frame and disposed on opposite sides of said wheel for retaining a load.

4,055,355

ROAD VEHICLES

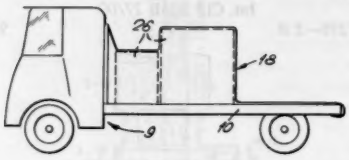
Christopher Daniel Dowling Hickey, 5 Heathside, Hinchley Wood, Esher, Surrey, England.

Filed Mar. 24, 1976, Ser. No. 669,989

Claims priority, application United Kingdom, Mar. 27, 1975, 13112/75

Int. Cl.² B60P 7/00

U.S. Cl. 280—179 A **10 Claims**



1. A road vehicle including a vehicle body having an air-impermeable support surface for receiving a load, an air-impermeable rigid upright headboard at one end of said support surface, said headboard having an aperture therein, an air-impermeable flexible oversheet for covering, in use, the load supported by the support surface to form with the support surface a restriction to air flowing into the space formed between the oversheet and the support surface, said oversheet being secured to said headboard, and means for continuously applying suction to said aperture to partially evacuate said space and thereby to collapse the oversheet around the load to restrain the load from movement with respect to the support surface.

4,055,356

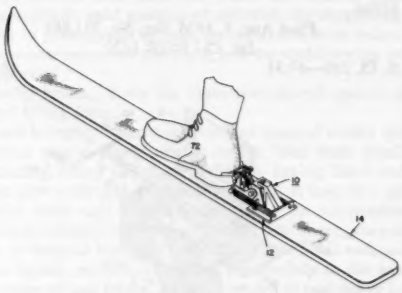
SAFETY SKI BINDING

Hans de Groot, 309 Wildman Arms, Swarthmore, Pa. 19081

Filed May 17, 1976, Ser. No. 686,899

Int. Cl.² A63C 9/08

U.S. Cl. 280—628 **47 Claims**



1. A safety ski binding including

a. a boot retaining member for engaging a ski boot at the heel or toe thereof;

b. operating means operably connected to the boot retaining member and movable between a locked position for forcing the retaining member against the boot to retain the boot on the ski, and an unlocked position for releasing the retaining member from the boot to permit the ski boot to separate from the ski;

c. support means for the operating means movable relative to a ski in two directions;

d. first biasing means for resisting the displacement of the support means relative to the ski in one of said two directions;

e. second biasing means for resisting the displacement of the support means in the other of said two directions;

f. actuated means movable to unlock the operating means for permitting said operating means to move into its unlocked position for releasing the retaining member from the ski boot when the support means moves a certain distance in either one or both of said two directions.

4,055,357

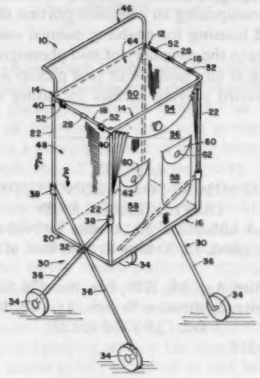
COLLAPSIBLE CARRY-ALL CART

Viera Sorocin, 77 Quebec Avenue, Apt. 1025, Toronto, Ontario, Canada

Filed Apr. 5, 1976, Ser. No. 673,373

Int. Cl.² B62B 11/00

U.S. Cl. 280—641 **5 Claims**



1. A collapsible carry-all cart comprising:

a frame including upper and lower front and rear transversely extending elongated members, retractable upper and lower pairs of elongated spaced parallel side members secured therebetween, and upright corner post members connected between the respective junctures of the upper and lower transverse and side members;

a pair of leg members carried slidably respectively by the upright post members at the sides of the frame, said pair of leg members each including a pair of leg elements having a wheel member mounted rotatably at the lower end thereof and a collar at the other end thereof, said collars being slidably mounted on the corresponding post members, and said leg elements being pivotably connected to each other at a location intermediate the ends thereof;

a handle element carried by said frame projecting upwardly therefrom at the rear thereof;

and a cover member secured to said frame and depending therefrom to provide a storage compartment.

4,055,358

NITRO-PHTHALIDES, THEIR MANUFACTURE AND THEIR USE IN RECORDING SYSTEMS

Robert Garner, Ramsbottom, England, and Jean Claude Petitpierre, Kaiseraugst, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

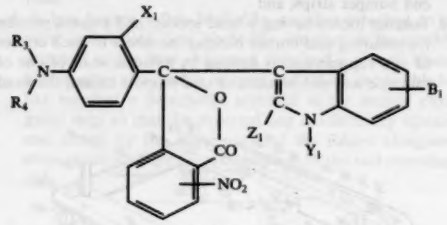
Continuation of Ser. No. 471,393, May 20, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 666,860

Claims priority, application United Kingdom, May 21, 1973, 24080/73

Int. Cl.² B41L 1/36; C07D 209/20

U.S. Cl. 282—27.5 **17 Claims**

1. A nitro-phthalide of the formula



wherein X_1 represents alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 12 carbon atoms or alkanoyloxy with 2 to 4 carbon atoms, Z_1 represents hydrogen, alkyl with 1 to 4 carbon atoms or phenyl, Y_1 represents hydrogen, benzyl or alkyl with 1 to 12 carbon atoms, R_3 and R_4 each represents hydrogen, alkyl with 1 to 12 carbon atoms or benzyl and B_1 represents hydrogen, chlorine, nitro, amino, mono- or dialkylamino with 1 to 4 carbon atoms in each alkyl part and mixtures of nitro isomers thereof.

11. Pressure-sensitive copying paper system containing included in its colour-reactant system a colour former as defined in claim **1.**

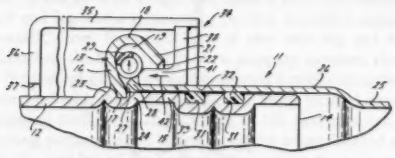
17. A process for making copies with a pressure-sensitive copying paper containing microcapsules, and an electron acceptor, each capsule containing a colour former, wherein the colour former is a nitro-phthalide as defined in claim **1.**

4,055,359

QUICK-CONNECT TUBULAR COUPLINGS

Irvin E. McWethy, Gravette, Ark., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 17, 1975, Ser. No. 632,874
Int. Cl.² F16L *35/00*
U.S. Cl. 285—39 **7 Claims**



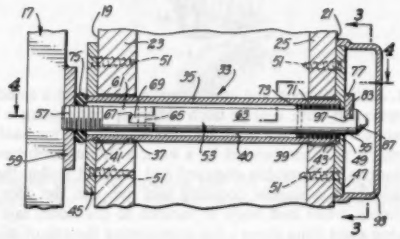
1. A tubular coupling comprising:
a first tube having an end portion,
a cage means mounted externally on the end portion in axially inwardly spaced relation to the terminal end of the latter,
the cage means having a radial base portion having a circular aperture through which the tube end portion projects, a curved wall forming an annular chamber and a circular flange angularly inclined toward the tube end portion in the general direction of the terminal end of the latter, the flange terminating in radially spaced relation to the tube end portion surface,
retention means on the first tube end portion engaged with the base portion of the cage means to hold the latter against axial displacement,
a second tube having an end portion telescopically mounted on the first tube end portion and having an outwardly inclined flare at its terminal end,
the flared end projecting into the cage means through the space between the surface of the first tube end portion and the cage means flange,
the inclined outer surface of the flared end of the second tube making an angle with the longitudinal axis of the second tube which is substantially the same as the angle made to the same axis by the inner surface of the inclined flange,
circular spring means contained within the cage means interposed between the second tube end portion flare and the cage means flange preventing axial withdrawal of the second tube end portion from the cage means and thereby preventing telescopic disengagement of the second tube from the first tube,
and "O" ring means externally mounted on the first tube end portion between the terminal end of the latter and the retention means to prevent leakage between the telescoped tube end portions.

4,055,360

SECURITY LOCK

Bartello C. Russi, 2925 Mendoza Drive, Costa Mesa, Calif. 96702

Filed Apr. 21, 1976, Ser. No. 678,908
Int. Cl.² E05C *3/14*
U.S. Cl. 292—228 **2 Claims**



1. A security lock for a first member comprising:
a tube having inner and outer ends and a passage extending between said ends thereof;
a shaft including at least first and second shaft sections and attaching means for attaching said shaft sections together for pivotal movement relative to each other, said shaft having outer and inner end portions;
said shaft having a first position in which it is received in said passage of said tube with the inner end portion of the shaft projecting beyond the inner end of said tube and with the attaching means being within said passage of said tube, said outer end being attachable to the first member;
latching means including said inner end portion of said shaft for releasably locking the shaft in the first position whereby upon release of the latch means said shaft is released to move toward the outer end of the tube;
said latching means including a locking member, means for mounting the locking member for pivotal movement toward and away from said inner end portion of said shaft at least when said shaft is in said first position, resilient means for urging the locking member toward the inner end portion of the shaft at least when said shaft is in said first position, and cooperating surfaces on said inner end portion and said locking member for retaining said shaft in said first position;
cam means on at least one of said locking member and said inner end portion of said shaft responsive to movement of the shaft toward the first position to cam the locking member away from the shaft;
abutment means for preventing the locking member from pivoting to a position in which the cam means is ineffective to cam the locking member away from the shaft as the shaft moves toward the first position;
a mounting plate adjacent the inner end of the tube, said mounting plate having an aperture therein through which the inner end portion of the shaft can project, said locking member being pivotally mounted on said mounting plate

and said abutment means being carried by the mounting plate;

a seal for sealing between the tube and the shaft; and

resilient means in said tube for urging the shaft toward the outer end of the tube.

4,055,361

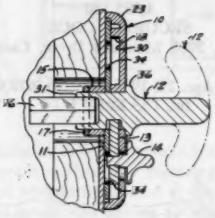
DOOR LOCK ATTACHMENT

Adolph Moses, 8 E. 83rd. St., New York, N.Y. 10028

Filed Oct. 14, 1975, Ser. No. 622,405

Int. Cl.[2] E05B *13/00*

U.S. Cl. 292—359 **8 Claims**



1. A thumb knob and stop assembly including a spindle for cooperation with a door latch assembly comprising a body, means carried by the body for affixing it to a door, said body having a hole surrounded by a boss, a thumb-knob having a cylindrical hub rotably disposed and retained within the hole in said boss, a spindle coupling said hub and the door latch assembly when said body is secured to the door, said body having a slot lying along a line intercepting the axis of said hub, an actuating knob having a pin projecting therefrom and extending through said slot, said slidable knob being movable between first and second positions lengthwise of said slot, a stop member carried by said pin, said body further comprising spaced means lying along said line and forming a recess slidably engaging a first end of said stop, a recess in said boss also lying along said line and slidably receiving the other end of said stop member, whereby said stop member is restricted to sliding movement, a recess in said hub, said other end of said stop when in said first position extending through said boss and into the recess in said hub and restricting rotation thereof and in said second position being retracted from engagement with said hub, said stop further including biasing means and spring means contacting said biasing means whereby said spring means will maintain said stop in either its first or second positions.

4,055,362

BUMPER ASSEMBLY FOR A ROLLING CART

Frederick R. Becker, III, Dallas, Pa., assignor to Metropolitan Wire Corporation, Wilkes-Barre, Pa.

Filed June 18, 1976, Ser. No. 697,699

Int. Cl.[2] B60R *19/02*

U.S. Cl. 293—62 **17 Claims**

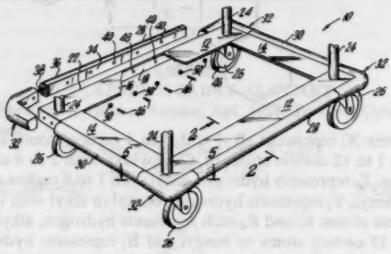
1. A bumper assembly for a rolling cart and the like, said bumper assembly comprising:

a. support means including a pair of elongated, spaced apart side and end sections defining a frame having inside and outside peripheral surfaces;

b. a pair of resilient side bumper strips and a pair of resilient end bumper strips mounted on the outside surfaces of said side and end sections of said support means, respectively, with outwardly facing surfaces of said side and end bumper strips being unbroken;

c. a plurality of resilient corner bumper members interfitted intermediately in corner spaced defined by adjacent ends of said side and end bumper strips with each of said corner bumper members being disposed between an associated one of said side bumper strips and an associated one of said end bumper strips; and

d. fastener means having a head section and a shank section for securing said corner bumper members to each corner of said support means defined by adjacent ends of one of said side and end sections of said support means, the head



section of each said fastener means being on the inside surface of said support means and said shank section of each said fastener means extending through a portion of said support means and terminating in an interior of said respective corner bumper member, the outwardly facing surface on each said corner bumper member being unbroken.

4,055,363

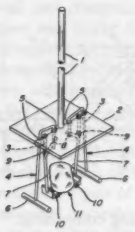
SANITARY DEVICE FOR PICKING UP ANIMAL DROPPINGS

Pete Mandich, 1103 Sheffield Ave., Alliquipa, Pa. 15001

Filed Feb. 28, 1977, Ser. No. 772,772

Int. Cl.[2] A01K *29/00*

U.S. Cl. 294—19 R **5 Claims**



1. A portable device for picking up objects without having ones' hands come into contact with the said object comprising:

a. A first assemblage including a first folded elongated strip projecting angularly from and secured to the lower end of a first angular operating rod, which operating rod is pivotally connected at its bend to a frame and pivotally connected at its opposite end to a second operating rod which second operating rod is an inverted U-shape having its lower end extended to a point in an approximate plane with the said elongated strip.

b. A second assemblage including a second folded elongated strip projecting angularly from and secured to the lower end of a third angular operating rod which operating rod is pivotally connected at its bend to a frame and pivotally connected at its opposite end to a fourth operating rod, which fourth operating rod is an inverted U-shape having its lower end extended to a point in an approximate plane with the said elongated strips.

c. A third assemblage including a frame in which the said first and third operating rods are connected for holding the said rods in such a position to allow the said folded elongated strips to move towards each other and away

from each other with the manipulation of the operating rods.

d. A bag having a first blade-like member attached to its open end which first blade-like member is detachably attached to the first elongated strip and a second blade-like member attached to its open end which second blade-like member is detachably attached to the second elongated strip so that the inverted bag is selectively opened and closed by the movements of the folded elongated strips resulting from the manipulation of the said operating rods.

4,055,364

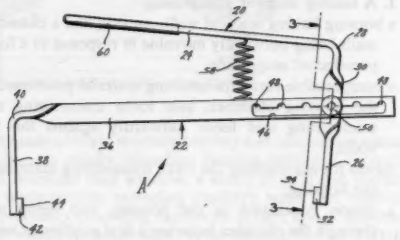
LIFTING DEVICE FOR BATTERIES AND THE LIKE

Max Breite, 810 Spring Ave., St. Charles, Mo. 63301

Filed Sept. 23, 1976, Ser. No. 725,867

Int. Cl.² B65G 7/12

U.S. Cl. 294—63 B **10 Claims**



1. A tool for lifting a battery or other object having upright walls, said tool comprising: a first gripping member in the form of a rigid and unitary structure having an upright end leg and a handle extended from the upper end of the end leg with the handle being presented at an angle to that end leg, the end leg having a gripping surface at its lower end; a second gripping member in the form of a rigid and unitary structure having an upright end leg and a connecting portion extended generally horizontally from the upper end of that end leg and being located below the handle on the first gripping member, the end leg of the second gripping member having a gripping surface at its lower end with that gripping surface being located opposite the gripping surface on the end leg of the first member, the connecting portion of the second member being located adjacent to the end leg of the first member where the connecting portion is provided with a slot and a plurality of spaced apart notches which open into the slot, the slot extending in the direction of the connecting portion; and a pin extended through the slot in the connecting portion and secured in the end leg of first member, the pin being sized to fit in the notches of the slots to enable the first member to pivot relative to the second member at any one of the notches, whereby an upwardly directed force exerted on the handle will cause the gripping surfaces of the two gripping members to move together so that the battery may be clamped between them, the pin further being sized to slide along the slot from one notch to the other so that the spacing between the end legs of the two gripping members may be varied, whereby the tool may be adjusted to accommodate batteries of varying widths.

4,055,365

CHOKER ASSEMBLY

James David Kucherry, Rte. 1, Bonners Ferry, Idaho 83805

Filed Mar. 22, 1976, Ser. No. 669,096

Int. Cl.² B66C 1/34; F16G 11/04

U.S. Cl. 294—78 R **4 Claims**

1. A choker assembly slidably mountable to a ferrule ended logging winchline, comprising:

a choker rope formed of a length of interwoven wire rope having a central core strand surrounded by a plurality of outer interwoven twisted strands;

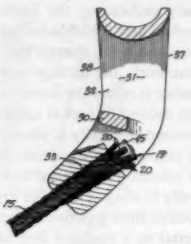
a choker ferrule fixed at one end of the rope;

a choker hook slidably mounted on the choker rope and adapted to releasably receive the choker ferrule;

slider means for releasably mounting the remaining end of the choker rope to the winchline;

wherein the slider means includes an elongated longitudinally curved slider body having an enlarged winchline receiving opening formed transversely through one end and a choker rope receiving opening formed longitudinally through the other end of the slider means and in open communication with the winchline receiving opening for receiving the remaining choker rope end therethrough;

wherein the choker rope receiving opening tapers from an



enlarged open end opening into the winchline receiving opening to a reduced open end at the terminus of the slider body;

wherein the choker rope receiving opening includes spiral grooves complementary to the outer twisted strands of the choker rope; and

a wedge means separate from the slider body which includes a conical sleeve of sufficient size to be mountable into the tapered choker rope receiving opening by access through the enlarged winchline receiving opening in which the conical sleeve has a longitudinal base for slipping over the central core strand and a conical exterior surface for spreading the outer interwoven strands radially outward into the spiral grooves to releasably grip the outer strands in the choker rope receiving opening and thereby prevent the remaining end of the choker rope from being drawn through the choker rope receiving opening.

4,055,366

ELEVATING ROOFS

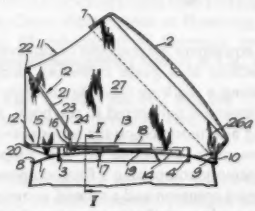
David Lee, Northchurch House, Northchurch, England

Filed Oct. 6, 1975, Ser. No. 619,627

Claims priority, application United Kingdom, Oct. 8, 1974, 43465/74

Int. Cl.² B60D 3/34

U.S. Cl. 296—23 G **9 Claims**



1. For use in conjunction with a vehicle including a roof and a substantially rectangular opening in said roof, an elevating

roof comprising in combination a rigid substantially rectangular member which is adapted to be hinged along one edge to said roof for movement between a lowered position covering said substantially rectangular opening and a raised position where it provides one wall of a covered area, a foldable material extending between corresponding edges of said rigid member and said substantially rectangular area which, in use, is unfolded in the raised position of said rigid member to provide the other walls of said covered area, a framework comprising first and second generally U-shaped members comprising a pair of movable arms and a bridge member attached to said arms at one end thereof, said first generally U-shaped member being supported in a plane above and substantially parallel to the plane of said rectangular opening with its arm ends opposite its said bridge member mounted in guides located adjacent each said transverse edge of said opening and the ends of said second generally U-shaped member opposite its said bridge member loosely embracing the limbs of said first generally U-shaped member, said foldable material being attached to said bridge members and being shaped and arranged in conjunction with said framework, the arrangement being such that when said rigid member is raised the frame members are substantially simultaneously moved to partial raised positions, whereby the ends of said second generally U-shaped member can be moved outwardly to engage against abutments provided on the first member, and whereby continued outward movement of said second generally U-shaped member urges both frame members to their respective limit positions where they support the said foldable material in a position overhanging the edge of said rectangular opening, such that a region of said elevating roof associated with said covered wall area overhangs said rectangular opening to provide at least for a lower part of the elevated roof an area which is greater in plan than the area of the roof opening.

4,055,367

LONGWALL MACHINE WITH CAPTIVATING BRACKET

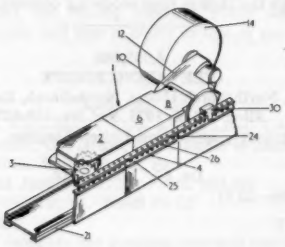
William Joseph Jarvis, Bestwood, England, assignor to Coal Industry (Patents) Limited, London, England

Filed July 27, 1976, Ser. No. 709,243

Claims priority, application United Kingdom, Aug. 13, 1975, 33645/75

Int. Cl.[2] E21C *27/36*

U.S. Cl. 299—53 **10 Claims**



1. Mine equipment for trapping or captivating a ranging arm mining machine to a guide extending along one side of the machine along a working face, the machine including a body, a support trunnion connected to the body, and a cutter-carrying ranging arm mounted on the support trunnion, including a bracket assembly securable to the support trunnion, the bracket assembly comprising a first component for attachment to the support trunnion and a second component for extending around the guide such that in use when the bracket assembly is mounted on the support trunnion the machine is trapped to or captivated to the guide.

4,055,368

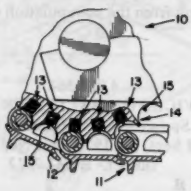
BIASING ELEMENT HAVING ONE OR MORE FORCE STAGES

John W. Sogge, Cedar Rapids, Iowa, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 28, 1976, Ser. No. 680,815

Int. Cl.[2] B62D *55/12*

U.S. Cl. 305—57 **6 Claims**



1. A biasing element, comprising:

a housing having resilient walls, an axis, and a chamber, said walls being outwardly movable in response to a force of a preselected magnitude;

a compressible force transmitting material positioned within the housing chamber, said force transmitting material transmitting said force outwardly against the housing walls;

means for maintaining the force transmitting material within the housing;

a piston positioned in the housing and being movable through the chamber between a first position at which the piston is urging against the force transmitting material and a second position at which the force transmitting material is moved by the piston into forcible contact with the resilient housing walls and said housing walls are moved outwardly in response to said forcible contact by said force transmitting material being at said preselected magnitude; and

a Belleville spring positioned in the chamber between the piston and force transmitting material.

4,055,369

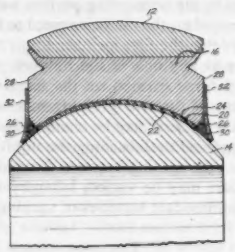
SEAL FOR A SPHERICAL BEARING

William Fred Lynn, and Gordon Marvin Walker, both of Renton, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 12, 1975, Ser. No. 576,491

Int. Cl.[2] F16C *33/72, 33/74*

U.S. Cl. 308—187.1 **8 Claims**



6. A seal for a self-aligning bearing having matching spherical surfaces between an inner and an outer race comprising: a ring to extend from the spherical surface of the inner race to a side of the outer race, said ring rigidly attached to the side of the outer race and of a depth to bow outward toward ring inner diameter and to permit about 5 degree misalignment of the bearing; a chamfer located on the side of the outer race and

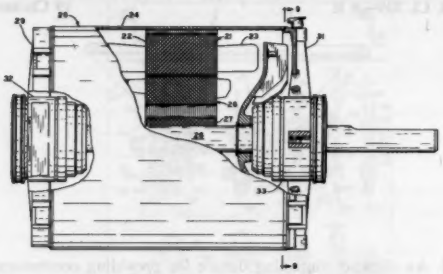
under the ring; and a resilient sealing material filling the space therebetween.

4,055,370

DYNAMOELECTRIC MACHINE LUBRICATION SYSTEM AND METHOD OF ASSEMBLING THE SAME

Eldon R. Cunningham, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Filed June 9, 1976, Ser. No. 694,307
Int. Cl.[2] H02K *5/16*; F16C *33/74*
U.S. Cl. 308—36.1 **17 Claims**



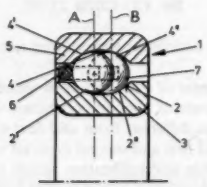
1. A dynamoelectric machine bearing and lubrication system comprising: an axially extending bearing having a centrally disposed lubricant feed window, a notch at each end thereof, and circumferentially extending capillary walls that establish circumferentially extending capillaries at each end of the bearing about a shaft accommodated in the bearing; and oil wicking means that includes a feeding tab disposed in the lubricant feed window, a first pick-up tip disposed in a first notch, and a second pick-up tip disposed in a second notch; said first pick-up tip and second pick-up tip each being in oil feeding communication with the feeding tab and in oil absorbing relation with a circumferentially extending capillary, whereby end leakage oil from the bearing is recirculated through the pick-up tips to the feeding tab.

4,055,371

BALL BEARING HAVING STAGGERED BALLS

Horst Manfred Ernst, Eltingshausen; Armin Olschewski, Schweinfurt; Rainer Schurger, Schwanfeld; Lothar Walter, Schweinfurt; Manfred Brandenstein, Aschfeld, and Erich Burkl, Stammheim, all of Germany, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

Filed June 7, 1976, Ser. No. 693,509
Claims priority, application Germany, June 26, 1975, 7520254[U]
Int. Cl.[2] F16C *33/40*
U.S. Cl. 308—201 **8 Claims**



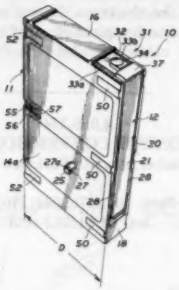
1. In a radial ball bearing having inner and outer bearing rings with an inner race and an outer race respectively, a plurality of balls in said inner and outer races and adapted to roll therein, and a cage for holding said balls spaced apart from one another; the improvement comprising means for holding said balls spaced from one another alternately in the axial direction of said bearing, whereby a first group of said balls engages one side of said inner and outer races and a second group of said balls engages the opposite side surfaces of the same said inner and outer races to inhibit axial play in said ball bearing.

4,055,372

STORAGE RECEPTACLE FOR MAGNETIC TAPE CASSETTE

Keizaburo Tozawa, Tokyo; Hideo Amatsu; Shinichiro Takahashi, both of Yokohama; Kazumi Fujimoto, Hoya, and Kishio Ikeda, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 6, 1976, Ser. No. 674,211
Claims priority, application Japan, June 24, 1975, 50-77913
Int. Cl.[2] A47B *81/06*
U.S. Cl. 312—15 **18 Claims**



1. A storage receptacle for a magnetic tape cassette comprising:

a housing including spaced apart, parallel side walls which between their forward edges, define an opening of said housing;

a holder for embracing a magnetic tape cassette and which is movable with the cassette therein through said opening of the housing between said side walls of the latter; and

pivot means connecting said holder with said housing for swinging movement relative to the latter between an opened position in which said holder projects forwardly from said housing for receiving and relinquishing a cassette, and a closed position in which said holder cooperates with said housing for enclosing a cassette in said holder;

said pivot means defining a fulcrum for said swinging movement of the holder which is spaced rearwardly from the center of gravity of said holder with a cassette therein in all positions of said holder and which is shifted forwardly in respect to said housing in the course of the swinging movement of said holder from said closed position to said opened position.

4,055,373

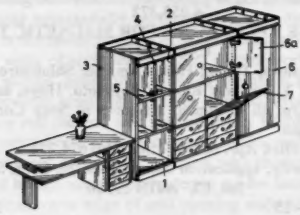
FURNITURE CONSTRUCTION SYSTEM

Peter B. Andresen; Claus Winter, both of Hamburg, and Siegfried H. Hendel, Mannheim, all of Germany, assignors to Inbauproduct Innenausbausysteme GmbH & Co., KG, Hamburg, Germany

Filed Oct. 6, 1975, Ser. No. 620,184
Claims priority, application Germany, Oct. 4, 1974, 2447414
Int. Cl.[2] A47B *87/00*
U.S. Cl. 312—263 **4 Claims**

1. In a furniture construction system in which furniture is made from a plurality of plate elements arranged horizontally and vertically according to choice, of the same thickness and each plate element having hole rows in the region of two oppositely lying edges of the plate element, angle brackets for

fixing the plate elements to one another, and fixing elements such as screws for fixing the brackets to the plate elements, the improvement which comprises making the distances between centers of the holes in the hole rows the same as the thickness of the plate elements, and setting the first and last holes of at



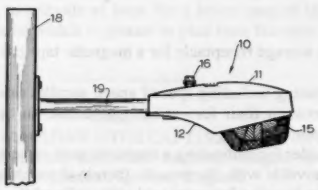
least one plate element at a distance from the edge of the plate element equal to the thickness thereof and the first and last holes of at least one other plate element at a distance from the edge of the plate element of half the thickness of the plate element.

4,055,374

LAMP FIXTURE CONVERSION METHOD

Womack Hardy Barber, Jr., 613 Parkview Drive, Durham, N.C. 27712

Filed Sept. 10, 1976, Ser. No. 722,224
Int. Cl.² H01J *9/50*
U.S. Cl. 316—2 **5 Claims**



1. A method of converting a lamp fixture of the type containing a mercury vapor lamp to a fixture containing a low pressure sodium lamp comprising the steps of

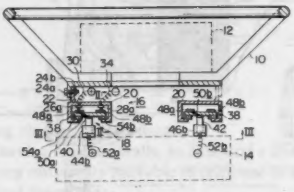
a. removing the fixture from its respective mounting location;
b. inverting the fixture and removing the fixture lower housing half and associated lens;
c. removing the mercury vapor lamp from its socket in said fixture;
d. anchoring the fixture reflector to the fixture housing to prevent relative movement between the reflector and the housing during the conversion operation;
e. removing the mercury vapor lamp socket and any associated socket seals;
f. removing any electrical components associated with the mercury vapor lamp operation not compatible with low pressure sodium lamp operation and replacing the same with electrical components compatible with the desired low pressure sodium lamp operation;
g. affixing a bracket to the inner wall surface of the upper housing half rearward of said reflector, said bracket mounting a sodium lamp socket external of said reflector and aligned with the existing socket opening in the reflector and said bracket having a forward member engaging said reflector;
h. installing a low pressure sodium lamp in its respective socket, whereby such sodium lamp extends from its socket external of the reflector to a point proximate the forward end of the reflector; and
i. replacing the fixture lower housing half and lens while aligning the seal portion of said reflector with the mating portion on said lens.

4,055,375

ELECTRIC CONTACTING DEVICE

Naoki Ogawa, and Kazuo Ikawa, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 27, 1976, Ser. No. 690,790
Claims priority, application Japan, May 29, 1975, 50-71468
Int. Cl.² H01R *39/00*
U.S. Cl. 339—6 R **19 Claims**



1. An electric contacting device for providing continuous electric connection between first and second electric devices respectively mounted on a rotatable member rotatable about its axis and a relatively stationary member, said electric contacting device comprising:

a first annular member coaxially securely mounted on said rotatable member;
a second annular member adapted to connect to said relatively stationary member so as to be coaxially spaced apart from said first annular member;
a first conductive annular plate coaxially mounted on said second annular member and electrically connected to said second electric device; and
at least two first conductive spring arms mounted on said first annular member on a first imaginary annular portion which is coaxial with said first annular member, said first conductive spring arms being urged into sliding contact with said first conductive annular plate at the free ends thereof and electrically connected to said first electric device, further said first conductive spring arms being different in size to each other so as to respectively have different characteristic frequencies.

4,055,376

CALIBRATION RETICLE FOR MEASURING MICROSCOPES

Gunter W. Daberko, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 2, 1975, Ser. No. 618,981
Int. Cl.² G02B *27/32*
U.S. Cl. 350—10 **13 Claims**

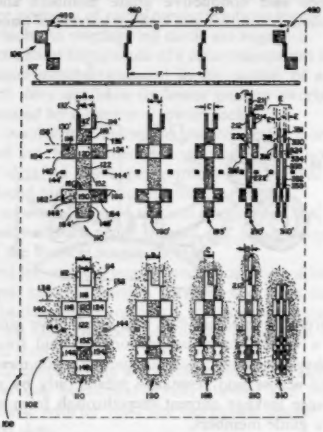
1. A calibration reticle for a measuring microscope comprising:

a plurality of areas of s first contrast value;
a plurality of areas of a second coantrast value, said second contrast value different from said first contrast value;
said areas of said first and second contrast values arranged to establish within said calibration reticle at least two parallel, calibration reference lines spaced from each other by a known distance;
each said calibration reference line defined with respect to at least two boundary lines from which it is equidistant;
each said boundary line defined by a portion of the boundary between an area of said first contrast value and an area of said second constrast value, said at least two boundary lines with respect to which a given calibration reference line is defined comprising:

a first boundary line defined by a portion of a boundary between

a first localized region which has said first contrast value, at least substantially all of said first localized region being on a first side of said given calibration reference line, and

a second localized region which has said second contrast value, at least substantially all of said second localized region being on a second side of said given calibration reference line; and



a second boundary line defined by a portion of a boundary between

a third localized region which has said first contrast value, at least substantially all of said third localized region being on said second side of said given calibration reference line, and

a fourth localized region which has said second contrast value, at least substantially all of said fourth localized region being on said first side of said given calibration reference line.

4,055,377

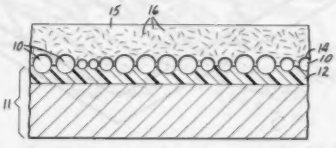
MAGNETICALLY ORIENTABLE RETROREFLECTORIZATION PARTICLES

Randall L. Erickson, North Oaks, and Terry R. Bailey, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St.Paul, Minn.

Filed Aug. 3, 1976, Ser. No. 711,140

Int. Cl.² G02B *5/128*

U.S. Cl. 350—105 **20 Claims**



1. A mass of discrete retroreflectorization particles useful for forming a retroreflective coating on a substrate, the individual particles each comprising at least one transparent microsphere, specular reflective means in optical connection with a first portion of the microsphere so as to provide retroreflection of light incident on the opposed portion of the microsphere, and a magnetic layer underlying the specular reflective means and having a magnetic axis parallel to the optical axis on which said first and opposed portions of the microsphere are aligned, whereby when the particles are coated onto a substrate in the presence of a magnetic field having flux lines of appropriate polarity perpendicular to the substrate, the particles tend to become aligned in a common direction that retroreflects light incident on the coating.

4,055,378

SILICONE CONTACT LENS WITH HYDROPHILIC SURFACE TREATMENT

Paul Feneberg, Planegg, and Ulrich Krekeler, Munich, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

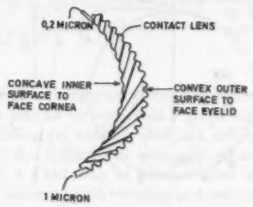
Continuation-in-part of Ser. No. 517,096, Oct. 22, 1974, Pat. No. 3,959,105, which is a continuation-in-part of Ser. No. 318,853, Dec. 27, 1972, abandoned. This application Apr. 10, 1975, Ser. No. 566,603

Claims priority, application Germany, Dec. 31, 1971, 2165805; Oct. 25, 1973, 2353495; Apr. 11, 1975, 2417660

The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.

Int. Cl.² G02C *7/04*

U.S. Cl. 351—160 **24 Claims**



1. A contact lens, comprising a body which includes a silicone elastomer and silicone dioxide as a filler, said body having a concave surface adapted to face the cornea of an eye, and said body having a convex surface adapted to face the eyelid, said convex surface possessing hydrophilic characteristics, and the contact angle for said convex surface being smaller than the contact angle for said concave surface, said contact angles being measured with distilled water, and said contact angle for said concave surface having a value such that said body is movable relative to the cornea of an eye when said body is positioned on the cornea, said convex surface having been made hydrophilic by a treatment which included subjecting said convex surface to the action of activated gas ions in an atmosphere consisting at least predominantly of oxygen when said convex surface had an outer layer of said silicon elastomer, and said gas ions having impinged first regions of said outer layer and having had an energy such that said outer layer was destroyed at said first regions and the silicon dioxide filler of said body was exposed at said first regions, said gas ions also having impinged second regions of said outer layer and having had an energy such that said outer layer transformed to silicon dioxide at said second regions, and said convex surface having undergone an improvement in the hydrophilic characteristics thereof due to the exposure of the silicon dioxide filler at said first regions and the transformation to silicon dioxide at said second regions.

4,055,379

MULTIFOCAL LENS

John Talley Winthrop, Wellesley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 389,044, Aug. 16, 1973, abandoned. This application Dec. 8, 1975, Ser. No. 638,870

Int. Cl.² G02C *7/06*

U.S. Cl. 351—171 **10 Claims**

1. A multifocal ophthalmic lens having invisible divisions

between viewing zones comprising a lens body having a refractive surface being characterized by

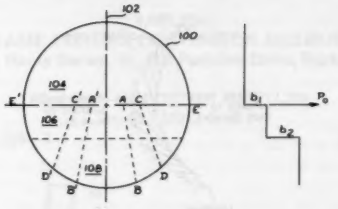
a smooth, unbroken principal meridional curve lying along the refractive surface in a generally vertical direction and dividing the refractive surface into two similar lateral portions, the curvature of the principal meridional curve varying to provide a predetermined plurality of levels of constant dioptric focal power according to a predetermined law thereby dividing the refractive surface into a like plurality of viewing zones in vertical juxtaposition, each pair of juxtaposed viewing zones having a boundary therebetween,

the uppermost viewing zone having a first constant dioptric focal power and being adapted for viewing distant objects over the full width of the multifocal ophthalmic lens,

the remaining viewing zones being divided into at least three horizontally disposed areas,

the centermost area in each of the remaining viewing zones being of a constant dioptric focal power higher than the constant dioptric focal power at the principal meridional curve in the viewing zone juxtaposed thereabove,

the two outermost of said areas in each of the remaining



viewing zones being of such aspherical curvature that at a boundary the relative heights of the viewing zones forming the boundary are constant along the boundary throughout the width of each outermost area and each having a surface curved substantially in accordance with the equation

$$(\delta^2 Z/\delta x\, \delta y) =$$

where y and x represent horizontal and vertical directions respectively which define a plane, and Z is height of said curved surface from said plane, said surface comprising a portion of a surface of revolution whose axis of revolution is vertical and lies in a common plane with said principal meridional curve to optically compensate for skew distortion so that at all points thereon the principal axes of astigmatism lie in vertical and horizontal planes to permit a wearer of the lens to perceive horizontal and vertical lines in the visual environment as being horizontal and vertical, and

the boundaries between the viewing zones being blended by sagging process so that all connections between viewing zone surfaces are continuous and boundaries of the zones are invisible.

4,055,380

TRANSFER CHARGE MAINTAINING SYSTEM

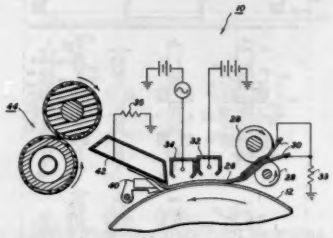
Stephen Borostyan, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1975, Ser. No. 626,888
Int. Cl.[2] G03G *15/048*
U.S. Cl. 355—3 R **2 Claims**

1. In an electrostatographic copying apparatus in which imaging material is transferred from an image support surface to overlying variable resistance copy members in a transfer station by electrical transfer means which deposit transfer charges on the copy member, and in which electrically conductive copy member guide members outside of the transfer station conductively contact the copy member while the copy member is in the transfer station and thereby can receive leakage currents of said transfer charges through said copy member affecting the transfer of said imaging material, the improvement wherein:

self-biasing means are provided for automatically self-biasing said conductive guide members to a voltage level proportional to the level of said leakage current of transfer charges through the copy member to said conductive guide members,

wherein said self-biasing means consists solely of 100 to 400 megohm resistance means electrically connecting between said conductive guide members and electrical ground to conduct said leakage current of transfer charges



therethrough to self-bias said conductive guide members to a voltage level proportional to said transfer charge leakage current to said conductive guide members generated across said resistance means only by said transfer charge leakage current therethrough from said conductive guide members,

said self-biased voltage level being sufficiently high to effectively suppress the conduction of said transfer charge leakage currents to said conductive guide members, and

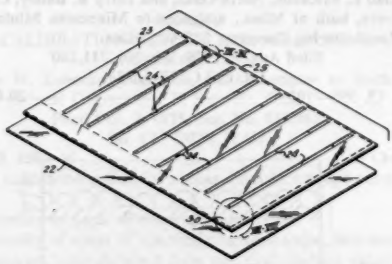
said resistance means providing the only electrical connection between said conductive guide members and electrical ground.

4,055,381

CARD HOLDER

John B. Lauer, and Betty Alma Wade, both of Houston, Tex., assignors to John B. Lauer, Houston, Tex.

Filed Jan. 7, 1976, Ser. No. 647,100
Int. Cl.[2] G03B *27/62*; A47F *7/00*
U.S. Cl. 355—75 **1 Claim**



1. A holder for supporting data carrying cards comprising:

a substantially rectangular backing sheet of fusible material,

a front sheet substantially matching in size the backing sheet and also being made of fusible material,

said front sheet having a series of horizontal vertically spaced slots formed therein alternating with a series of rectangular solid portions of said front sheet,

said front sheet and said backing sheet being aligned and fused together along left and right vertical seams thereby leaving said slot substantially free,

fused seams securing lower edges of said front sheet to said

backing sheet leaving the upper slot edges of said front sheet free and forming upwardly opening pockets between said front sheet and said backing sheet with the lower edges of said pockets closed,

whereby cards can be supported in the pockets with their lower edges supported along the lower closed edges of the pockets and with the upper portions of the cards projecting above the upper slot edges,

a set of a cards of greater height than said pockets, one of said cards being engaged in each selected pocket,

lower portions of each respective card being concealed by upper portions of cards projecting from lower pockets in which the overlapping cards are engaged,

said front sheet being made of a clear transparent material,

an opaque member engaged in the pocket of any card which does not have its lower portion overlappingly concealed by a card in a lower pocket,

whereby confidential matter on the concealed portions of the card can be retained in confidence while non-confidential data on the upper portion of the cards can be reproduced in conventional office copiers,

said front sheet having a vertical integral material portion at one vertical border thereof and being co-extensive with the vertical length thereof,

right and left vertical seams fused on opposite sides of said integral material portion between said front sheet and said backing sheet to form a row identification pocket adjacent said other pockets for receiving a row identification strip,

said front sheet having a horizontal integral material portion at one horizontal border thereof and being co-extensive with at least the horizontal length of said spaced slots,

and upper and lower horizontal seams fused on opposite sides of said horizontal integral material portion to form a column identification pocket for receiving a column identification strip.

4,055,382

TESTING METHOD FOR THE SEPARATE DETERMINATION OF VARYING WORK SURFACE FLAWS AND ARRANGEMENT FOR SAID METHOD

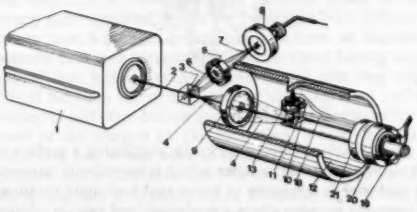
Paul Ziekman, Bilthoven, and Jan A. P. van Riet, Nieuwegein, both of Netherlands, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

Filed Jan. 27, 1976, Ser. No. 652,734

Claims priority, application Netherlands, Jan. 29, 1975, 7501009

Int. Cl.² G01N *21/48*

U.S. Cl. 356—210 **5 Claims**



1. A method for the automatic checking of machined part surfaces for surface flaws comprising the steps of confocally directing a plurality of parallel bundled light rays onto the surface to be checked by means of optical instruments, whereby said light rays are reflected by said surface with varying intensity and in accordance with the nature of said surface, redirecting a portion of said light rays, via said optical instruments, towards at least one light-sensitive element which converts the reflected light energy into electrical signals, and further including the step of separately evaluating the reflected amount of light, for variation in intensity and dispersion, in order to indicate a plurality of different types of surface flaws.

4,055,383

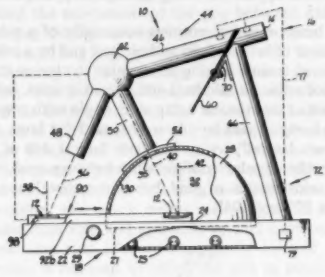
METHOD OF AND ASSEMBLY FOR MEASURING EQUIVALENT SPHERE ILLUMINATION

Robert Dale Zeller, and Daryl Dean Sullivan, both of Newark, Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed Feb. 20, 1976, Ser. No. 659,616

Int. Cl.² G01J *1/10*

U.S. Cl. 356—229 **14 Claims**



1. A method of determining the amount of equivalent sphere illumination on a task as viewed from a given viewing point, said method including (a) locating said task and a contrasting colored reference in a lighted first area, saidtask and reference being oriented in a fixed way as viewed from said viewing point, (b) at said viewing point, viewing said task and reference through adjustable light filtering means, (c) adjusting said light filtering means to an adjusted position to provide specific visibility of said task from said viewing point and through said filtering means while causing the luminance of said reference at least to appear unfiltered as viewed through said adjusted filtering means from a predetermined point behind said filtering means regardless of the adjusted position of said light filtering means, (d) positioning a task and a reference in a second area, said last-mentioned task and reference, as viewed from as associated viewing point, being oriented in substantially the same way as said task and reference are oriented in said first area as viewed from said given viewing point, (e) illuminating said task and reference in said second area with sphere illumination, (f) with said light filtering means fixed in said adjusted position, viewing said task and reference in said second area through said filtering means from said associated viewing point, (g) varying the intensity of sphere illumination on said task and reference in said second area until the visibility of said task, as viewed from said associated veiwing point through said filtering means, is substantially equal to said specific visibility while causing the luminance of said reference in said second area at least to appear unfiltered as viewed through said filtering means from an associated predetermined point, and (h) thereafter, measuring the intensity of sphere illumination of said second task, the improvement comprising:

a. using a single task and reference as both said task and reference in said first area and said task and reference in said second area; and

b. moving said single task from said first area to said second area after said step of adjusting said light filtering means.

4,055,384

ROOFING APPARATUS

Augustine M. Palzer, 3919 - 52nd Ave. North, Brooklyn Center, Minn. 55429

Filed Oct. 4, 1976, Ser. No. 729,378

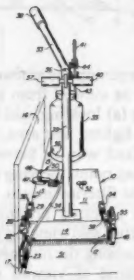
Int. Cl.² A46B *11/00, 17/02*

U.S. Cl. 401—48 **8 Claims**

1. A portable apparatus for cementing edges of lengths of

sheet material in adherent relationship over a roof, comprising a horizontally oriented base structure having contact means at its lower surface for applying pressure upon said sheet material, said base structure having one substantially straight lateral side and having a leading edge and a trailing edge, a brush member for applying cementing fluid underneath an edge of said sheet material, bracket means anchored on said base structure for holding said brush member forwardly beyond the leading edge of said base structure, a nozzle for discharging cementing fluid into said brush member, conduit means for conveying cementing fluid to said nozzle, and handle means for guiding said apparatus in movement along an edge of sheet material, said apparatus being additionally characterized in that:

a. said brush member consists essentially of a substantially flat layer of bristles held at their heel end by a substantially flattened ferrule having an angular section at the portion thereof adjacent said heel end of said bristles, said angular section of said ferrule being at an angle with respect to the main body of said ferrule so that said flat layer of bristles projects laterally away from one lateral side of said main body, the angular configuration between said main body and said bristles of said brush member being between about 90° and 104°,



b. said bracket means comprises a ferrule holder for holding said main body of said flattened ferrule in vertical orientation at a location substantially parallel and adjacent to an imaginary vertical plane defined as a vertical plane which extends parallel and adjacent to said one substantially straight lateral side of said base structure, said main body of said flattened ferrule being held in said ferrule holder with said bristles of said brush member extending from the lower end and extending laterally from said main body in a direction away from said imaginary vertical plane on the same side thereof as said base structure,

c. said nozzle is mounted on said apparatus for discharge of said cementing fluid within said angular configuration of said brush member at the heel end of the bristles thereof, and

d. said base structure is free of any element which projects laterally outward therefrom beyond said imaginary vertical plane at any location along said one substantially straight lateral side of said base structure, whereby said combination of structural features renders said apparatus effective for sealing even the edges of sheet material located adjacent to an upstanding wall.

4,055,385

WORK PIECE CLAMP ARRANGEMENTS

Nils G. Bjors, 161 Crestview St., Barrington, Ill. 60010

Filed Nov. 17, 1975, Ser. No. 632,319

Int. Cl.² F16B *35/00*

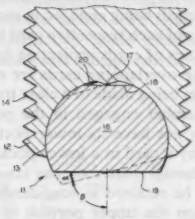
U.S. Cl. 85—1 SS **6 Claims**

1. A clamping screw device for clamping work pieces, said device comprising a screw body, exterior threads on said screw body, a socket on one end of said screw body, sphere means located within said socket, the opening to said socket being smaller than the diameter of the sphere means, whereby said sphere is retained in said socket,

a first flat surface on one side of said sphere means,

said first flat surface located outside of said socket for use in abutting said work pieces,

limiting means for limiting the rotation of said sphere within said socket,



said limiting means including substantially conical protrusion means on the wall of the socket,

said limiting means further including a cooperating surface on the portions of said sphere within said socket, and

said protrusion centrally located in said cooperating surface when said first flat surface is normal to the longitudinal axis of said clamping screw device.

4,055,386

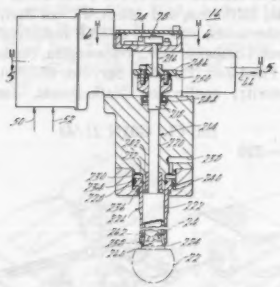
CONTROL SYSTEM FOR COMPENSATING FOR MACHINE TOOL WEAR

Lawrence L. Chynoweth, Utica, and Kurt O. Tech, Grosse Pointe Shores, both of Mich., assignors to The Cross Company, Fraser, Mich.

Continuation of Ser. No. 511,761, Oct. 3, 1974, abandoned, which is a division of Ser. No. 360,669, May 16, 1973, Pat. No. 3,914,678. This application Apr. 22, 1976, Ser. No. 679,382

Int. Cl.² B23B *39/06, 51/00*

U.S. Cl. 408—13 **4 Claims**



1. For a machine having a tool for machining a surface of a workpiece, a rotatable member which is operatively connected with said tool in a manner to move said tool upon rotation of said rotatable member about a predetermined axis for adjusting a dimension of said machined surface of said workpiece, a tool adjusting system comprising:

engaging means for engaging said rotatable member when aligned therewith on said predetermined axis and being rotatable for rotating said rotatable member about said predetermined axis thereby moving said tool, said engaging means having a first cylindrical surface and said rotatable member having a second cylindrical surface, said engaging means being adapted for providing gripping engagement of said second cylindrical surface by said first cylindrical surface which is sufficient for rotation of said

rotatable member about said predetermined axis upon rotation of said engaging means, said first and second cylindrical surfaces being adapted so that they may be grippingly engaged for rotation of said rotatable member about said predetermined axis when aligned on said predetermined axis regardless of the rotational alignment therebetween about said axis;

angular position determining means connected to said engaging means for rotation therewith and for providing an indication of the angular position of said engaging means; and

rotating means connected to said engaging means for rotating said engaging means in accordance with said indication of the angular position of said engaging means whereby the positioning of said tool to adjust said dimension of said machined surface may be accomplished through said indication of the angular position of said engaging means since said engaging means may grippingly engage said rotatable member regardless of the rotational alignment therebetween.

4,055,387

LIQUID FUEL INJECTION PUMPING APPARATUS

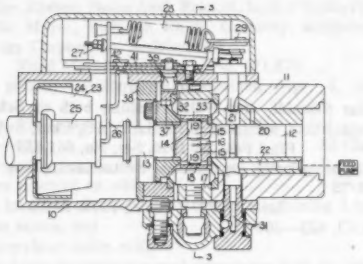
James Charles Potter, London, England, assignor to CAV Limited, Birmingham, England

Filed Dec. 5, 1975, Ser. No. 638,156

Claims priority, application United Kingdom, Dec. 6, 1974, 52969/74

Int. Cl.² F04B *1/06, 19/02*

U.S. Cl. 417—221 **5 Claims**



1. A liquid fuel injection pumping apparatus for supplying fuel to an internal combustion engine and comprising a housing, an injection pump located within the housing and adapted to be driven in timed relationship with an engine with which the apparatus is associated, said injection pump including a rotary part supported within the housing, a bore defined in said rotary part, a plunger movable in said bore, an angularly adjustable cam ring surrounding said part and having angularly spaced cam lobes, a roller engaging said cam ring and positioned between the cam ring and the plunger, an outlet connected to said bore and through which fuel flows during movement of the plunger by the cam lobes, a fuel feed pump for supplying fuel to said bore to effect outward movement of the plunger in the direction opposite to that effected by the cam lobes, said fuel feed pump being driven by said rotary part, a control device for determining the amount of fuel supplied to the injection pump from said fuel feed pump, a pair of stop rings positioned at the opposite ends of the roller for limiting the outward movement of the plunger thereby to control the maximum amount of fuel which can be supplied by the injection irrespective of the setting of said control device, the spacing of said stop rings being temporarily adjustable to allow additional outward movement of the plunger so that the injection pump can supply an additional amount of fuel for starting purposes, a first ring member mounting one of said stop rings, said first ring member being axially and angularly movable within the housing, a second ring member positioned in side by side relationship to said first ring member, means locating said second ring member against axial movement in the direction away from the other stop ring, adjustment means for providing limited angular adjustment of said second ring member, interengageable formations on the adjacent side faces of said ring members whereby relative angular movement of said ring members will result in relative axial movement thereof, a piston cylinder combination mounted on said housing, means connecting said piston to said cam ring whereby movement of the piston within the cylinder will impart angular movement to the cam ring to adjust the timing of delivery of the injection pump, passage means connecting said cylinder with the outlet of the feed pump, a peg engaged with said first member, a slot for guiding the movement of the peg between extreme positions, the peg during movement from one extreme position to the other imparting angular movement to said first ring member, the spacing of the stop rings in said one extreme position being such that the normal maximum amount of fuel can be delivered as determined by the setting of said adjustment means, and in said other extreme position the spacing of the stop rings being such that excess of fuel can be delivered, resilient means acting to bias said peg towards said one extreme position, catch means for retaining said peg in said other extreme position, said catch means including a pin member engaging said cam ring and operable by said cam ring whereby when said cam ring is moved angularly by said piston said catch means is released to allow the peg to assume said one extreme position.

4,055,388

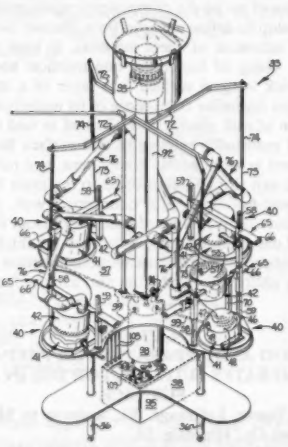
APPARATUS FOR MOLDING A PROTECTIVE PAD

Herman S. Johns, Gastonia, N.C., assignor to Medical Specialties, Inc., Charlotte, N.C.

Division of Ser. No. 563,585, March 31, 1975, Pat. No. 3,992,238. This application Aug. 30, 1976, Ser. No. 718,666

Int. Cl.² B29C *27/14*

U.S. Cl. 425—4 R **12 Claims**



1. An apparatus for molding a protective pad adapted to be positioned on an elbow or heel of a patient and characterized by a generally arcuate cross-sectional configuration, said apparatus comprising

a generally convex mold surface,

a generally concave mold surface having a plurality of relatively small perforations distributed over the area thereof,

means for mounting said convex and concave mold surfaces for movement with respect to each other and between a non-operative position wherein the surfaces are separated and said concave mold surface faces upwardly to permit receipt of a particulate molding material therewithin, and

an operative position wherein said convex and concave mold surfaces are in spaced apart, face to face relationship to define a mold cavity therebetween having a generally arcuate cross-sectional configuration,

means for drawing a partial vacuum rearwardly of said concave mold surface such that the vacuum acts through said perforations to maintain a predetermined distribution of the molding material within the concave mold surface during the transfer of the surfaces from said non-operative position to said operative position, and

means for heating the molding material when such material is positioned in said mold cavity and said surfaces are in said operative position.

4,055,389

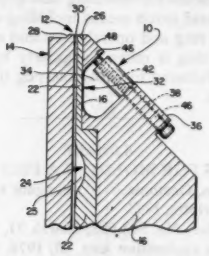
DIE CONSTRUCTION

Glenn L. Hayward, Chippewa Falls, Wis., assignor to Leesona Corporation, Warwick, R.I.

Filed July 26, 1976, Ser. No. 708,615

Int. Cl.² B29F *3/04*

U.S. Cl. 425—466 **7 Claims**



1. A die for the extrusion of thermoplastic materials comprising a plurality of metal die components positioned in face-to-face relationship to define a plastic flow channel having an exit slot for the extrusion of sheet material, at least one of said components being of bimetallic construction and having a relatively thick integral surface face layer of a metal having characteristics dissimilar from those of its underlying base, the configuration of said plastic flow channel in said one component formed essentially entirely in said surface face layer, an exit lip formed in said one die component, said exit lip in part defining said exit slot and connected to the main body of said die component by means of a connecting web, said exit lip movable about said web towards and away from the lip of the other of said die components so as to vary the thickness of said exit slot wherein at least a cross sectional portion of said web is essentially entirely formed from said surface face layer.

4,055,390

METHOD AND APPARATUS FOR PREPARING AGGLOMERATES SUITABLE FOR USE IN A BLAST FURNACE

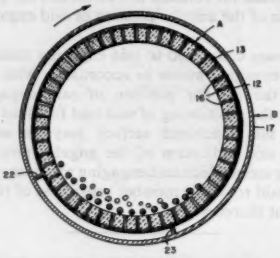
William P. Young, LaGrange, Ill., assignor to Molten Metal Engineering Co., Hinsdale, Ill.

Filed Apr. 2, 1976, Ser. No. 673,072

Int. Cl.² F27B *15/00*; C22B *1/16*

U.S. Cl. 432—14 **8 Claims**

1. A method for preparing agglomerates suitable for charging into a blast furnace comprising rotating a cylinder having open ends about its longitudinal axis while said axis is inclined with the horizontal, charging into the upper open end of said cylinder while said cylinder is rotating a stream of iron oxide bearing material containing **5** to **15** weight percent of combustible material, said material being in particulate form and of a size such that substantially all of said iron oxide bearing material will pass a ¾ inch screen, whereby said iron oxide bearing material is caused to move downwardly in said cylinder in a tumbling stream toward the lower end of said cylinder, subjecting said charged material at the upper end portion of said cylinder to contact with a flame whereby to ignite said material in said portion, passing an oxygen containing gas in a confined stream to an area below said stream of material as the



material passes downwardly in said cylinder, passing said gas from said area through the wall of said cylinder and upwardly through said stream to support combustion of materials in said stream and heat said material to from 2200° F to 2600° F and discharging from the lower end of said cylinder agglomerates formed of said material during its passage through the said cylinder.

4,055,391

CRUCIBLE

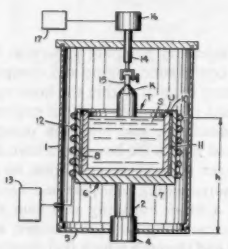
Walter Schmidt, and Walter Stählin, both of Schaffhausen, Switzerland, assignors to Prolizenz AG, Chur, Switzerland

Filed Feb. 26, 1976, Ser. No. 661,433

Claims priority, application Switzerland, June 11, 1975, 7518/75

Int. Cl.² F27B *14/10*; F27R *14/00*

U.S. Cl. 432—264 **11 Claims**



1. A crucible, for use in heating a melt,

comprising in combination,

an outer wall and an inner wall of iridium defining an inner chamber to receive said melt;

said outer and inner walls defining therebetween an outer chamber operable to receive a heat distribution medium at least partially filling said outer chamber and having a melting point above about 1500° C and which is below the melting point of said melt and a boiling point above about 1750° C which is above the melting point of said melt, said inner body separating said chambers preventing direct liquid communication between said chambers.

4,055,392

PROCESS FOR DYEING BLENDED FABRICS

Stefan Koller, Ramlinsburg; Marielise Pacher, Munchenstein, and Karl Emmenegger, Pratteln, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

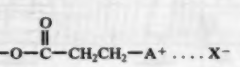
Filed Apr. 24, 1975, Ser. No. 571,344

Claims priority, application Switzerland, Apr. 29, 1974, 5871/74

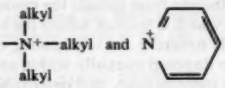
Int. Cl.[2] D06P *3/82*

U.S. Cl. 8—21 C 12 Claims

1. A process for dyeing or printing a blend of wool and polyester fibers which comprises the use of a dye of the formula



wherein A is selected from the group consisting of



X is an anion and F is a radical of a dye of the disperse class.

4,055,393

PROPYLENE OXIDE REACTION PRODUCTS, PROCESS FOR THEIR MANUFACTURE AND THEIR USE

Paul Schafer, Riehen; Heinz Abel, Reinach, both of Switzerland, and Fritz Mayer, Weil am Rhine, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,874

Claims priority, application Switzerland, Apr. 4, 1975, 4293/75

Int. Cl.[2] C09B *67/00;* C09F *5/08;* D06P *1/613*

U.S. Cl. 8—62 33 Claims

1. A propylene oxide reaction product and a salt thereof obtained by reacting an adduct of

a. an at least trihydric aliphatic alcohol containing 3 to 10 carbon atoms, and

b. 1,2-propylene oxide, with

c. an aliphatic dicarboxylic acid containing 2 to 10 carbon atoms, an aromatic dicarboxylic acid containing 8 to 12 carbon atoms, or an anhydride thereof, and

a. a fatty acid containing 12 to 22 carbon atoms.

33. A printing paste containing at least one dye and at least one propylene oxide reaction product of the composition stated in claim 1.

4,055,394

DIAGNOSTIC TEST CARD

Stephen B. Friedman, Claremont, Calif., and Carl B. Linnecke, 69 W. Winnie Way, Arcadia, Calif. 91006, assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 18, 1976, Ser. No. 733,649

Int. Cl.[2] G01N *31/02, 33/16*

U.S. Cl. 23—253 TP 11 Claims

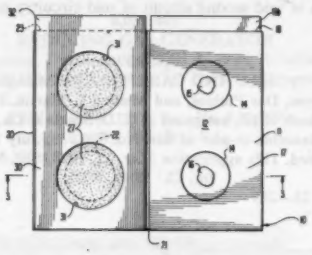
1. A closable test card for performing immunochemical diagnostic or serological tests on the surface thereof, comprising:

a. a test surface member comprising a substantially plane strip of a substrate material having a test surface which is substantially insoluble in, impermeable to, nonabsorbent to, and wettable by aqueous media;

b. a covering member coextensive in the area with said test surface member and foldable thereupon to permit preservation and visual observation of test results;

c. said test surface carrying at least one circumscribed test area containing at least one deposited dried reagent providing a predetermined amount of a test reagent, which upon being moistened is reconstituted to said reagent;

d. said covering member being joined to said test surface member and foldable thereover to form a closed test card, and including at least one area provided with a transparent convex viewing window, said area being positioned in such manner that when said covering member is folded over onto said test surface member said area and transparent window are in registry with said test reaction area, permitting viewing of the test area contents;



e. said covering member having adhered to the inner surface thereof a continuous sheet of an absorbent material which becomes transparent upon contact with a liquid, said sheet extending across said window area, permitting viewing of the test results through said windows when the test card is closed.

4,055,395

ANALYSIS APPARATUS

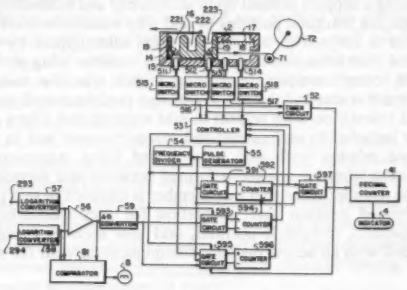
Tadashi Honkawa; Kenji Fukuda, and Mikio Shimizu, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 29, 1976, Ser. No. 737,094

Claims priority, application Japan, Oct. 31, 1975, 50-130404

Int. Cl.[2] G01N *21/24*

U.S. Cl. 23—253 R 9 Claims



1. An analysis apparatus for performing various chemical analysis using containers, each of which has at least one chamber containing specific reagent and a form thereof depending upon the analysis mode to be performed, comprising:

means forming a plurality of incubator chambers for successively heating the containers for various periods of time at a predetermined temperature depending on the forms of the containers that correspond to the analysis mode;

means forming a measuring chamber for receiving the container after the incubation in the incubator chambers; and photometry means comprising

a. a light source for radiating light of various wave length through said measuring chamber,

b. photometric measuring means for detecting the light

which passes through said measuring chamber and producing a correlated signal,

c. circuitry means having a first circuit for detecing the form of the container inserted into said measuring chamber and for selecting the light to be detected by said photometric measuring means depending on the form of the container in the measuring chamber, and a second circuit for receiving signals from said photometric measuring means and transforming them into readable data, and

d. indicator means receiving and displaying the readable data of said second circuit of said circuitry means.

4,055,396

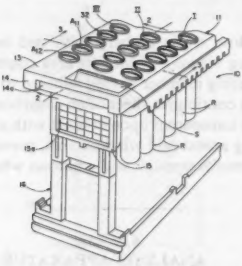
TRAY AND CARRIER ASSEMBLY

Rolf Meyer, Des Plaines, and Manuel I. Martin, Hoffman Estates, both of Ill., assignors to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 594,939, July 11, 1975, abandoned. This application Mar. 22, 1976, Ser. No. 669,138

Int. Cl.² B01L *9/06*

U.S. Cl. 23—259 **8 Claims**



1. In an assembly for accommodating a plurality of open end tubular receptacles, said assembly including a carrier and a tray member comprising one of a larger capacity tray and a smaller capacity tray, said trays provided with a plurality of openings formed therein within which said receptacles may be retained so as to freely depend from said tray, the improvement comprising a support defined upon said carrier and subtending and engaging marginal portions of said tray member whereby the latter is adapted to be removed from said support by being lifted therefrom, said support and tray member being provided with complementary interfitting means whereby said tray member is retained thereby in a unique predetermined position and orientation with respect to said support; and a base member included in said carrier and spaced beneath and in registered relation with said support and being interconnected thereto whereby a space is formed between said support and base member when said tray member is disposed in said predetermined position and orientation for accommodating the depending receptacle portions, said base member being provided with an access opening communicating with the space.

4,055,397

APPARATUS FOR SEPARATING A SUBLIMATION PRODUCT FROM A GAS

Hubertus Johannes Gerardus van Heel, Vriezenveen, Netherlands, assignor to Ultra-Centrifuge Nederland N.V., The Hague, Netherlands

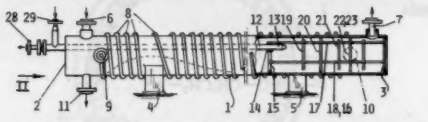
Filed June 8, 1976, Ser. No. 693,960

Claims priority, application Netherlands, June 26, 1975, 7507594

Int. Cl.² B01D *7/02*

U.S. Cl. 23—264 **1 Claim**

1. Apparatus for separating sublimation product from a gas which contains this product in the form of vapour, comprising an elongate substantially horizontal casing having a gas inlet near one end and a gas outlet near the other end so that gas flows longitudinally through the casing; heat exchange means cooperating with the exterior of the wall of the casing for cooling said wall below the sublimation temperature during the subliming process, means for assuring that an open channel for gas flow is maintained during the subliming process, said means comprising at least one permanently heated, elongate, rod-shaped element fitted eccentrically in the casing, said element extending in the same direction as the casing and being placed in the upper part of the casing, said heating element being manufactured of a material having good heat-conducting properties and projecting into the casing through a wall por-



tion over part of the length of the heating element so that heat can be supplied thereto from outside the casing, the end of the heating element which is located within the casing being supported on a baffle structure and said heating element comprising an inner tube disposed coaxially within an outer tube with an annular space therebetween, said outer tube being closed at the end located within the casing and said inner tube being open at the end located within the casing so that a heating medium can be supplied through the annular space between the tubes.

4,055,398

DUAL TEMPERATURE ISOTOPE EXCHANGE PROCESSES

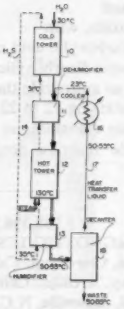
Gerard J. Pauluis, Brussels, Belgium, and Alistair I. Miller, Deep River, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed May 27, 1975, Ser. No. 580,692

Claims priority, application Canada, June 17, 1974, 202594

Int. Cl.² B01D *11/04;* **C01B** *5/02*

U.S. Cl. 23—270.5 W **2 Claims**



1. Apparatus for obtaining a product enriched in deuterium by dual temperature isotope exchange comprising:

a. a cold tower containing isotope exchange trays with a liquid as a first phase stream passing downward and a gas as a second phase stream passing upward, through the trays in the tower in counter-current isotope exchange relationship therein,

b. a hot tower containing isotope exchange trays with a liquid as a first phase stream passing downward and a gas as a second phase stream passing upward, through the trays in the tower in counter-current isotope exchange relationship therein,

c. means for introducing the liquid as input to the top of the cold tower.

d. a dehumidifier section,
e. means for passing the said liquid from the bottom of the cold tower through the dehumidifier to the top of the hot tower,
f. means for passing the said gas from the top of the hot tower through the dehumidifier to the bottom of the cold tower,
g. a humidifier section,
h. means for taking the said gas from the top of the cold tower and recycling it to the bottom of the hot tower via the said humidifier,
i. means for passing a third-phase liquid stream through the dehumidifier and the hot tower,
j. liquid separation means,
k. means for taking the first phase liquid stream and the third phase liquid stream from the bottom of the hot tower and passing them through the said humidifier to the liquid separation means where the two streams are separated,
l. means for taking the first phase liquid stream and passing to waste,
m. means for recycling the third phase liquid stream from the liquid separator means to the top of the dehumidifier, and
n. means for taking a product enriched in deuterium from the means for passing the said liquid from the bottom of the cold tower through the dehumidifier to the top of the hot tower.

4,055,399

TRACERS IN PREDETERMINED CONCENTRATION RATIOS

David R. Parrish, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 24, 1976, Ser. No. 744,478
Int. Cl.[2] E21B *47/00*; G01N *33/24*
U.S. Cl. 23—230 EP **3 Claims**

1. A method for tracing the flow of three or more slugs of fluid injected into a subsurface formation by means of a smaller number of tracers comprising:
adding a different one of said tracers to each of a number of injected fluid slugs equal to the number of said tracers;
adding a different preselected ratio of at least two of said tracers to each of the remaining injected fluid slugs;
recovering a sample of fluid at a recovery point; and
analyzing said sample to determine the concentration of each of said tracers.

4,055,400

EXTRACTING SULFUR AND ASH

Edgel P. Stambaugh, Worthington, Ohio, and George F. Sachsel, Boulder, Colo., assignors to Battelle Memorial Institute, Columbus, Ohio

Continuation-in-part of Ser. No. 382,536, July 25, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,454
Int. Cl.[2] C10L *9/10*; C10B *57/00*
U.S. Cl. 44—1 R **18 Claims**

1. A method of extracting a substantial proportion of the pyritic, organic, and sulfate sulfur compounds and ash present in a solid carbonaceous fuel of the coal or coke type comprising
mixing the fuel with an aqueous alkaline solution containing a sodium, calcium, or ammonium carbonate, or a calcium or ammonium hydroxide, sulfide, or hydrosulfide, or a plurality thereof,
heating the resulting mixture to at least about 125° C at a pressure of at least about 25 psig to leach out said sulfur compounds and ash,
separating the easily removable leached out materials from the solid remainder of the fuel, and washing said remainder of the fuel.

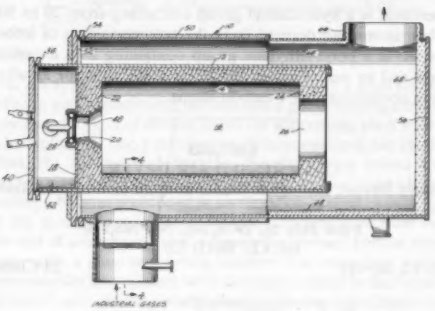
4. A method as in claim **1**, wherein the mixture is heated at a pressure provided at least in part by oxygen, hydrogen, nitrogen, oxygen plus nitrogen, or hydrogen plus nitrogen.

4,055,401

REDUCING GAS GENERATOR

David K. Beavon, Pasadena, and Earl J. Jirus, Arcadia, both of Calif., assignors to The Ralph M. Parsons Company, Pasadena, Calif.

Filed Jan. 14, 1975, Ser. No. 540,869
Int. Cl.[2] F01N *3/14*
U.S. Cl. 23—277 C **10 Claims**



1. Apparatus for generating hot gas free of molecular oxygen and soot by combustion of hydrocarbon fuel and mixing the hot gas with industrial gas, comprising:
a. a cylindrical combustion chamber providing an internal refractory surface and having at one end an elongated inlet opening forming a throat axially aligned with an outlet opening in an opposing end wall of the chamber, which wall provides a refractory surface, each opening being of a smaller cross-sectional area than the axial cross-sectional area of the combustion chamber, the end containing the outlet opening forming a portion of a first radiating surface;
b. a concentric cylindrical jacket enclosing the outlet end and having a second planar radiating end refractory surface facing the outlet opening of the combustion chamber, a portion of the jacket surrounding the cylindrical portion of the combustion chamber to form an annular passage therebetween, said concentric cylindrical jacket extending beyond the end of the combustion chamber having the outlet to form a mixing zone;
c. a windbox for introduction of an oxygen-containing gas enclosing the inlet opening of the combustion chamber;
d. means for directing the oxygen-containing gas into the windbox tangentially to the axis of the combustion chamber, whereby the gas has a rotating motion in passing through the throat;
e. means at the throat for forming a plurality of jets of fuel and steam directed into the combustion chamber through the throat simultaneously with passage of the rotating motion oxygen-containing gas through the throat; and
f. an inlet communicating with the annular passage for introduction of the industrial gas to the jacket and an outlet in the jacket adjacent the second radiating end surface for exhaust of the industrial gas and products of combustion from the combustion chamber.

4,055,402

GASOLINE COMPOSITION

John Battersby, Frimley; Eric Simon Forbes, Lightwater, and Angus Joseph Dickson Reid, Old Windsor, all of England, assignors to The British Petroleum Company Limited, London, England

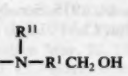
Division of Ser. No. 416,962, Nov. 19, 1973, abandoned. This application July 19, 1974, Ser. No. 489,893

Claims priority, application United Kingdom, Nov. 29, 1972, 55087/72

Int. Cl.[2] C10L *1/22*

U.S. Cl. 44—58 **5 Claims**

1. A fuel composition comprising a gasoline and from 50 to 200 parts per million of a carburetor detergent compound of the formula:



wherein R is a hydrocarbyl group containing from 20 to 500 carbon atoms and derived from the polymerization of isobutene, R^1 is a polymethylene group containing 2 to 6 carbon atoms and an amino group and R^{11} is a hydrogen or an alkyl group containing 1 to 4 carbon atoms.

4,055,403

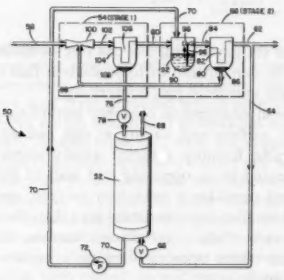
COMPRESSED AIR DRYER

Richard Strauss, Lexington, Mass., assignor to Whatman Reeve Angel Limited, Maidstone, England

Filed July 16, 1976, Ser. No. 705,910

Int. Cl.[2] B01D *53/14*

U.S. Cl. 55—31 **28 Claims**



1. A method of drying a compressed gas stream, which method comprises:

a. intimately contacting a large volume of a high-pressure, wet, compressed gas stream having a high relative humidity with a small amount of a hygroscopic liquid absorbent miscible with the water to be removed by dispersing the liquid absorbent in microdroplet form into the compressed gas stream, and separating the liquid absorbent and compressed gas by coalescing the entrained microdroplets of the liquid absorbent, to provide a wet liquid-absorbent mixture containing the water removed from the gas and a dry compressed gas stream;

b. reducing the liquid-absorbent mixture to a lower pressure than the high pressure of the wet compressed gas stream;

c. intimately contacting the liquid-absorbent mixture with a portion of the dry compressed gas stream at the lower pressure, and separating the liquid absorbent from the gas stream to provide a dry liquid absorbent and a lower-pressure gas stream containing the water removed from the liquid-absorbent mixture;

d. recycling the dry liquid absorbent for use in the contacting of the wet compressed gas stream;

e. removing the wet lower-pressure gas stream at the lower pressure; and

f. recovering a dry compressed gas stream.

21. A compressed gas dryer which comprises:

a. venturi-mixing means to contact intimately by dispersion a large volume of a high-pressure, wet, compressed gas stream having a high relative humidity with a small volume of a hygroscopic liquid absorbent miscible with the water to be removed, to disperse the liquid absorbent in microdroplet form in the gas stream, and means to separate the liquid absorbent and compressed gas by coalescence, to provide a wet liquid-absorbent mixture containing the water removed from the gas and a dry compressed gas stream;

b. means to reduce the liquid-absorbent mixture to a lower pressure than the high pressure of the wet compressed gas stream;

c. means to contact intimately the liquid-absorbent mixture with a portion of the dry compressed gas stream at the lower pressure, and means to separate the liquid absorbent from the gas stream, to provide a dry liquid absorbent and a lower-pressure gas stream containing the water removed from the liquid-absorbent mixture;

d. means to recycle the dry liquid absorbent for use in the contacting of the wet compressed gas stream;

e. means to remove the wet lower-pressure gas stream at the lower pressure; and

f. means to recover a dry compressed gas stream.

4,055,404

PROCESS FOR COLLECTING PAINT SPRAY MISTS IN SPRAY PAINT OPERATION

Wolfgang Daimer, Hilmgasse 15/9, A 8010 Graz, Austria

Filed July 8, 1975, Ser. No. 593,950

Claims priority, application Germany, July 10, 1974, 2433193

Int. Cl.[2] B01D *47/06*

U.S. Cl. 55—85 **9 Claims**

1. In a process for the separation of spray mists of water dilutable paints from the environment of a paint spray operation employing a water rinse or wash technique, the improvement wherein in rinse or wash water used to rinse the spray shops and/or wash the spray mist is mixed with a water-soluble, substantially non-volatile, low molecular weight, salt-like electrolyte, said electrolyte being present in an amount sufficient to provide an aqueous salt solution which, at 20° C., has a specific weight of at least 1.01, causing paint to coagulate so as to permit separation from the rinse water in known manner.

4,055,405

ACCESSORY FOR USE WITH VACUUM CLEANERS OR VACUUM-CLEANING CONDUITS

Carl Thun-Hohenstein, Vienna, Austria, assignor to Reflex Mobelpflegemittel-Erzeugung Konrad Schischlik & Sohne, Vienna, Austria

Filed Oct. 14, 1975, Ser. No. 621,792

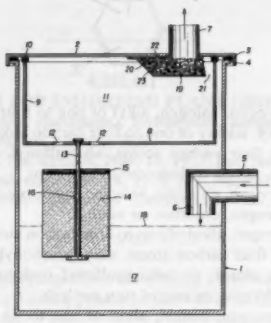
Claims priority, application Austria, Oct. 21, 1974, 8440/74; July 7, 1975, 5220/75

Int. Cl.[2] A47L *7/00*

U.S. Cl. 55—216 **7 Claims**

1. An accessory for use in a vacuum cleaner or a vacuum-cleaning conduit for collecting and holding liquid sucked up by the vacuum cleaner, comprising: a container having a reservoir for holding the liquid, a removable cover for said container and extending substantially horizontally thereover, means for dividing said container into said reservoir and a chamber above said reservoir and having a substantially horizontally extending plate, an inlet fitting connected to said cover for connecting the exterior of said reservoir to a hose leading to the suction nozzle of the vacuum cleaner or a vacuum cleaning conduit, said inlet fitting including a pipe extending vertically and having a lower end portion extending into said reservoir, an outlet fitting in said cover for connection to a hose leading to

the body of the vacuum cleaner or vacuum-cleaning conduit and communicating with said chamber, at least one passage in said plate between said chamber and said reservoir, and a float-controlled valve including a float vertically guided on



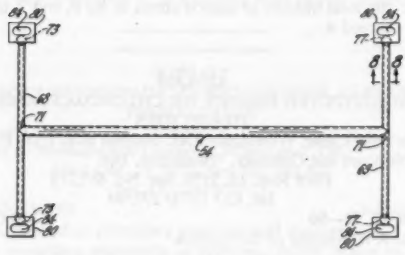
said lower end portion and a sealing plate loosely arranged on said float and adapted to close said passage to thereby shut off said chamber from said reservoir when the liquid in said reservoir reaches a predetermined level.

4,055,406

APPARATUS FOR MAKING GLASS FIBERS MATERIAL

Robert O. Slonaker, Pataskala, and Jack L. Emerson, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 12, 1976, Ser. No. 731,196
Int. Cl.² C03B *37/02*
U.S. Cl. 65—11 W 13 Claims



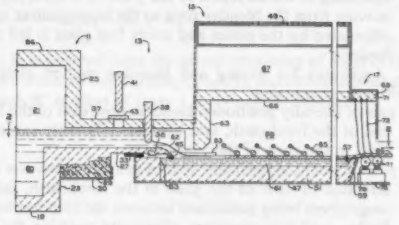
1. Apparatus for forming fibers from streams of heat-softened mineral material comprising, in combination, a stream feeder having a floor section provided with groups of orifices, means for supporting the stream feeder including a tubular support member extending lengthwise of and beneath the floor section, a body of electrically nonconducting nonmetallic material disposed between and engaging the tubular support member and the feeder floor section, a tubular member adjacent each end of the tubular support member and extending transversely of the tubular support member and in substantial parallelism with the feeder floor section, the ends of the tubular support member being joined with intermediate regions of the transversely extending tubular members, said transversely extending tubular members and the tubular support member accommodating circulating fluid for conveying heat away from the feeder floor section.

4,055,407

APPARATUS FOR THE MANUFACTURE OF FLAT GLASS HAVING A GLASS REFRACTORY DELIVERY PIECE AND METHOD OF INSTALLATION

Robert B. Heithoff, Wichita Falls, Tex., and George A. Pecoraro, Lower Burrell, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 1, 1976, Ser. No. 737,318
Int. Cl.² C03B *18/02*
U.S. Cl. 65—27 12 Claims



1. An apparatus for making glass comprising a glass melting, refining and conditioning furnace and a glass forming chamber containing a pool of molten metal for supporting glass while it is being formed into a continuous, dimensionally stable sheet of glass, the furnace and forming chamber being joined by a molten glass delivery facility comprising an elongated channel having a bottom positioned at an elevation spaced over the top of the molten metal, side members, a metering member over the end of said channel and wherein the channel bottom terminates with a glass supporting member that extends in a slope downwardly into contact with the molten metal in the forming chamber, said glass supporting member being a gas impervious refractory having a permeability of less than about 5×10^{-3} darcies at least in the portion thereof which contacts the molten metal.

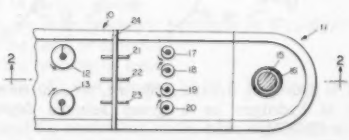
11. A method of modifying a glass forming chamber having a lip spaced above a pool of molten metal for delivering a layer of molten glass thereto, comprising the steps of inserting a refractory lip extension piece into the headspace of a glass forming chamber maintained under substantially reducing conditions above an advancing layer of molten glass, allowing the refractory lip extension piece to approach thermal equilibrium with the molten glass and its surroundings, forcing the refractory lip extension piece downwardly through the advancing layer of molten glass, moving the refractory lip extension piece into a position in substantial contact with the lip of the chamber, beneath the molten glass and in contact with the molten metal and fixing the refractory lip extension piece in that position.

4,055,408

FOREHEARTH HOMOGENIZATION METHOD AND APPARATUS

John D. Novak, Sylvania, Ohio, and Joseph W. Sell, Cranford, N.J., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 17, 1976, Ser. No. 742,408
Int. Cl.² C03B *9/18*
U.S. Cl. 65—135 8 Claims



1. Method of mixing and blending molten glass in a forehearth, comprising the steps of:

rotating a pair of side-by-side blenders upstream of the feeder end of the forehearth, said blenders effectively raising the glass in the zone of their influence;

rotating a plurality of homogenizers, spaced in a line transverse of the direction of flow of the glass in the forehearth, said homogenizers being between the blenders and the feeder, said homogenizers effectively pushing the glass downward in their zone of influence; and

positioning a plurality of elongated, vertical plates with their lower edge extending adjacent to the bottom of the forehearth with the vertical plane of the face of the plates extending in the direction of the glass flow whereby glass moving from the blender zone to the homogenizer zone is attenuated by the plates and cords free glass is fed to the feeder.

2. Apparatus for mixing and blending molten glass in a forehearth, comprising:

a pair of laterally positioned blenders upstream of the feeder end of the forehearth, said blenders effetively raising the glass in the zone of their influence;

a plurality of homogenizers, spaced in a line transverse of the direction of flow of the glass in the forehearth, said homogenizers being positioned between the blenders and the feeder, said homogenizers effectively pushing the glass downward in their zone of influence; and

a plurality of elongated, vertical plates immersed in the molten glass between the blenders and homogenizers, said plates being oriented with their length parallel to the direction of flow of glass in the forehearth whereby glass moving from the blender zone to the homogenizer zone is attenuated by the plates and cord free glass is fed to the feeder.

4,055,409

PYRAZOLE PLANT GROWTH REGULANTS

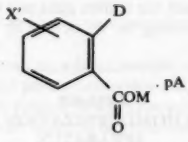
Alexander L. Johnson, and Philip B. Sweetser, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 397,720, Sept. 17, 1973, Pat. No. 3,948,937, which is a continuation-in-part of Ser. No. 230,508, Feb. 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 136,576, April 22, 1971, abandoned. This application Oct. 30, 1975, Ser. No. 627,462

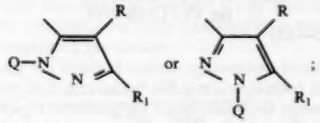
Int. Cl.[2] **A01N** *5/00*

U.S. Cl. 71—76 **24 Claims**

1. A composition which kills or retards the growth of undesired vegetation or beneficially modifies the growth of desired plants consisting essentially of an inert diluent and an effective amount of a compound of the formula



wherein D is

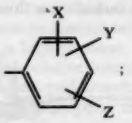


X' is hydrogen, fluorine, chlorine, bromine or methyl;

R is hydrogen or a group selected from —CH_2—, —CH_2CH_2—, and

—CH=CH— which joins the 4-position of the pyrazole ring with the 2-position of the R_1 substituent;

R_1 is sec-alkyl of three to six carbon atoms; tert-alkyl of four to six carbon atoms, cycloalkyl of five or six carbon atoms, naphthyl, biphenylyl, or



X is hydrogen, halogen, alkyl of one to four carbon atoms, hydroxy, alkoxy of one to four carbon atoms, alkylthio of one to four carbon atoms, alkysulfonyl of one to four carbon atoms, trifluoromethyl or nitro;

Y is hydrogen, chlorine, bromine, methoxy or methyl; and

Z is hydrogen, chlorine, or methyl;

Q is hydrogen, alkyl of one to four carbon atoms, alkanoyl of one to four carbon atoms, alkoxycarbonyl of two to five carbon atoms, or benzensulfonyl optionally substituted with chlorine or one of two methyls

M is hydrogen, benzyl, alkyl of one to six carbon atoms, hydroxyalkyl of two or three carbon atoms, alkoxyalkyl of three to five carbon atoms, sodium, potassium, lithium, calcium, magnesium, or

where

R_4, R_5 and R_6 are each independently hydrogen, alkyl of one to four carbon atoms or hydroxyalkyl of two to four carbon atoms; and

R_7 is hydrogen, alkyl of one to twelve carbon atoms or benzyl;

p is 0 or 1; and

A is HCl, H_2SO_4, HNO_3 and H_3PO_4

with the provisos that:

1. when M is other than hydrogen, benzyl or optionally substituted alkyl, *p* is O; and
2. the total number of carbon atoms in X, Y, and Z cannot exceed 4.

4,055,410

SUBSTITUTED BROMO- OR CHLOROACETAMIDE HERBICIDES

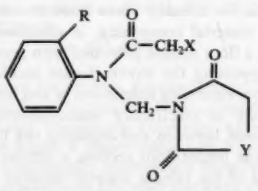
Jiin Duey Cheng, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 15, 1976, Ser. No. 667,279

Int. Cl.[2] **C07D** *277/04*

U.S. Cl. 71—90 **24 Claims**

1. A compound of the formula



where

R is alkyl or alkoxy of 1 to 4 carbon atoms;

X is chlorine or bromine; and

Y is S.

7. A composition for the control of undesirable vegetation in crops consisting essentially of a herbicidally effective amount

of a compound of claim 2 and at least one of (a) a surface-active agent and (b) a solid or liquid diluent.

13. A method for the control of undesirable vegetation in crops comprising applying to the locus of such undesirable vegetation a herbicidally effective amount of a compound of claim 1.

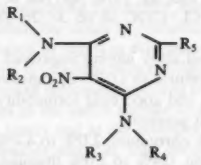
4,055,411

AGENTS FOR INHIBITING PLANT GROWTH

Hanspeter Fischer, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 415,209, Nov. 12, 1973, Pat. No. 3,948,914.
This application Dec. 18, 1975, Ser. No. 641,792
Claims priority, application Switzerland, Nov. 16, 1972, 16728/72
Int. Cl.[2] A01N 9/22
U.S. Cl. 71—92 8 Claims

1. A herbicidal composition comprising a herbicidally effective amount of a 5-nitropyrimidine derivative of the formula I



wherein R_1 represents alkyl with 1 to 6 carbon atoms, alkenyl with at most 5 carbon atoms, cycloalkyl with 3 to 6 carbon atoms, cyanoalkyl, or hydroxyalkyl, each having alkyls of from 1 to 6 carbon atoms, R_2 and R_3 each independently represents hydrogen or alkyl with 1 to 4 carbon atoms, R_4 represents alkyl with 2 to 6 carbon atoms or cycloalkyl with 3 to 6 carbon atoms, and R_5 represents methoxy, alkyl of 1 to 4 carbon atoms, dimethylamino or trihalomethyl, or the addition salt of such a nitro-pyrimidine derivative with non-phytotoxic inorganic or organic acids; together with a suitable inert carrier therefor.

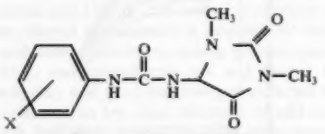
4,055,412

PHENYLUREIDOIMIDAZOLIDINEDIONES AS PLANT PROTECTANTS

Edward Koon Wah Wat, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1975, Ser. No. 643,392
Int. Cl.[2] A01N 9/22
U.S. Cl. 71—92 6 Claims

1. A method of protecting plants against damage caused by ozone consisting essentially of applying, to the plants to be protected, an effective amount of a compound of the formula:



wherein X is selected from hydrogen, fluorine, methoxy, meta-chlorine, or meta-bromine;

and at least one (a) inert diluent or (b) surfactant, and wherein said plants are selected from pinto bean, orange, lemon, tobacco, grape, potato, tomato, soybean, corn, lettuce, and alfalfa plants.

4,055,413

NOVEL ORGANOTIN HERBICIDAL COMPOUNDS

Donald J. Peterson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 23,457, March 27, 1970, Pat. No. 3,725,446.
This application Jan. 10, 1973, Ser. No. 322,328
Int. Cl.[2] A01N 9/12
U.S. Cl. 71—97 4 Claims

1. A method of controlling undesirable vegetation which comprises applying to the locus infested with such vegetation a herbicidal amount of a compound having the formula

$$R - S - CH_2 - Sn - R_3'$$

where R is selected from the group consisting of alkyl of from 1 to 14 carbon atoms; naphthyl; phenyl; and substituted phenyl; and each R' is alkyl of from 1 to 14 carbon atoms.

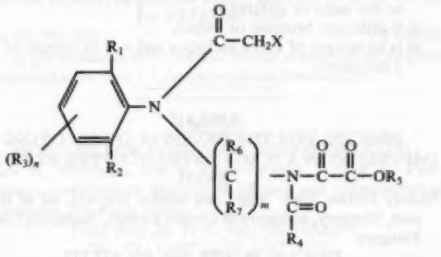
4,055,414

HERBICIDAL COMPOSITION AND METHOD OF USE

John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 11, 1976, Ser. No. 665,972
Int. Cl.[2] A01N 9/20; C07C 101/447
U.S. Cl. 71—111 16 Claims

1. A compound of the formula



wherein

R_1 and R_2 are independently hydrogen, halogen, C_{1-10} alkyl or alkoxy and may be the same or different;

R_3 is independently halogen, C_{1-10} alkyl or alkoxy or NO_2 and when n is 2 or 3 these groups may be the same or different;

R_4 is hydrogen, alkyl, alkenyl, alkynyl, alkoxyalkyl, polyalkoxyalkyl, haloalkyl, hydroxyalkyl, haloalkenyl, oxoalkyl, alkenyloxyalkyl, each of a maximum of 18 carbon atoms; C_{3-6} cycloalkyl; aryl, alkaryl, aralkyl, or aryloxyalkyl, each of which may be substituted with halogen, alkyl and/or nitro groups and having at least 6 and not more than 24 carbon atoms; amino or mono- and dialkylamino, monoarylamino, mono(haloaryl)amino, mono(trifluoromethylaryl)amino, and alkylalkoxyamino having a maximum of 10 carbon atoms;

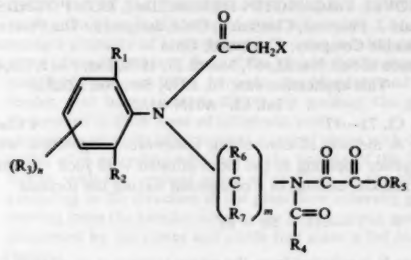
R_5 is alkyl, alkenyl, aryl, aralkyl or alkaryl having a maximum of 18 carbon atoms;

R_6 and R_7 are indenpendently hydrogen or C_{1-4} alkyl and may be the same or different;

X is chlorine, bromine or iodine;

m i an integer of 1 to 4 inclusive and n is an integer of 0 to 3 inclusive.

11. A method for controlling undesirable vegetation which comprises applying to the locus thereof a herbicidal composition comprising an adjuvant and an effective amount of a compound of the formula



wherein

R_1 and R_2 are independently hydrogen, halogen, C_{1-10} alkyl or alkoxy and may be the same or different;

R_3 is independently halogen, C_{1-10} alkyl or alkoxy or NO_2 and when n is 2 or 3 these groups may be the same or different;

R_4 is hydrogen, alkyl, alkenyl, alkynyl, alkoxyalkyl, polyalkoxyalkyl, haloalkyl, hydroxyalkyl, haloalkenyl, oxoalkyl, alkenyloxyalkyl, each of a maximum of 18 carbon atoms; C_{3-6} cycloalkyl; aryl, alkaryl, aralkyl, or aryloxyalkyl, each of which may be substituted with halogen alkyl and/or nitro groups and having at least 6 and not more than 24 carbon atoms; amino or mono- and dialkylamino, monoarylamino, mono(haloaryl)amino, mono(trifluoromethylaryl)amino, and alkylalkoxyamino having a maximum of 10 carbon atoms;

R_5 is alkyl, alkenyl, aryl, aralkyl or alkaryl having a maximum of 18 carbon atoms;

R_6 and R_7 are independently hydrogen or C_{1-4} alkyl and may be the same or different;

X is chlorine, bromine or iodine,

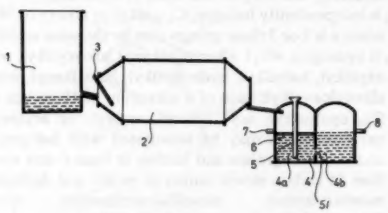
m is an integer of 1 to 4 inclusive and n is an integer of 0 to 3 inclusive.

4,055,415

PROCESS FOR THE REMOVAL OF ALLOYING IMPURITIES IN A SLAG-COVERED COPPER REFINING BATH

Mihaly Stefan; Tibor Nagy, and Sándor Daroczi, all of Budapest, Hungary, assignors to Csepeli Femmu, Budapest, Csepel, Hungary

Filed Apr. 16, 1976, Ser. No. 677,777
Claims priority, application Hungary, Apr. 16, 1975, CE 1040
Int. Cl.² C22B *15/00*
U.S. Cl. 75—74 **12 Claims**



1. In a process for the pyrometallurgical production of high-grade copper from a starting material selected from the group consisting of blister copper and copper scraps, the process comprising the successive steps of smelting and oxidizing a charge of the starting material, slagging the smelted and oxidized charge to obtain a pre-refined copper bath, and reducing the pre-refined copper bath to complete the refining, the improvement which comprises the further steps, accomplished between the slagging and reduction steps, of forming seconds the pre-refined copper bath an artificial slag cover consisting of a mixture of an oxide of at least one first element selected from the group consisting of silicon, phosphorous and boron and an oxide of at least one second element selected from the group consisting of titanium, aluminum, calcium, strontium, barium, magnesium, sodium, potassium and lithium, contacting the resulting covered bath with at least two elements selected from the group consisting of silicon, phosphorous, boron, titanium, aluminum, calcium, strontium, barium, magnesium, sodium, potassium and lithium, mixing the resulting bath for a first interval of at least 30 seconds, duration, maintaining the mixed bath in a rest condition for at least an additional 15 minutes, and then removing the artificial slag cover.

4,055,416

TANTALUM MODIFIED FERRITIC IRON BASE ALLOYS

Robert E. Oldrieve, Bay Village, and Charles P. Blankenship, Rocky River, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 21, 1976, Ser. No. 651,009
Int. Cl.² C22C *38/06, 38/26, 38/48*
U.S. Cl. 75—124 **5 Claims**

1. A ferritic steel alloy having improved high temperature strength at temperatures to 1,040° C, improved oxidation resistance to 1,150° C, and good cold formability consisting essentially of, in weight percents;

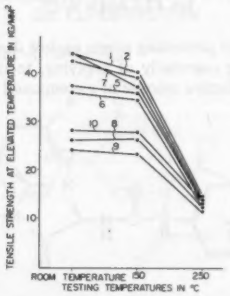
15.0% to 20.0% chromium, 2.0% to 4.0% aluminum, 0.4% to 1.0% silicon, 0.4% to 1.0% titanium, 0.01% to 0.05% carbon, 0.4% to 1.5% tantalum and the balance iron.

4,055,417

HYPER-EUTECTIC ALUMINUM-SILICON BASED ALLOYS FOR CASTINGS

Yoshiro Komiyama; Kunihiko Uchida, both of Okazaki, and Masaaki Tokui, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 557,096, March 10, 1975, abandoned. This application May 27, 1976, Ser. No. 690,658
Claims priority, application Japan, Mar. 13, 1974, 49-28938
Int. Cl.² C22C *21/04*
U.S. Cl. 75—142 **6 Claims**



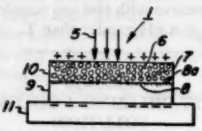
1. A hyper-eutectic aluminum-silicon based, high strength alloy for castings, consisting essentially of 16 to 25% of silicon, 3.0 to 5.5% of copper, 0.2 to 0.8% of magnesium, 0.3 to 0.8% of manganese, not more than 0.25% of titanium, and not more than 0.3% of iron, the balance being aluminum.

4,055,418

MIGRATION IMAGING METHOD USING AN IMAGING MEMBER EMPLOYING A SUPFACE SKIN

David A. Buckley, Rochester, and Frank G. Belli, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 499,716, Aug. 22, 1974, Pat. No. 3,979,210. This application July 23, 1975, Ser. No. 598,311
Int. Cl.[2] G03G *13/048*
U.S. Cl. 96—1 PS 3 Claims



1. An imaging method comprising:

a. providing an imaged member comprising:

a first layer of electrically insulating softenable material containing a background of migration material, said first layer of softenable material overlying a second layer of electrically insulating softenable material, said second layer of softenable material containing migration material distributed in depth in said second layer of softenable material in image pattern configuration, at least one of said layers of softenable material containing a surface skin located at the entire surface of at least one of said softenable layers and at the interface between said layers of softenable material, said surface skin formed by exposing said surface of at least one of said layers of softenable material to hardening radiation sufficient to form said surface skin having a thickness from about 0.1 to about 0.5 micron;

b. removing said background of migration material by splitting said member at said interface.

4,055,419

METHOD OF DEVELOPING ELECTROSTATIC IMAGES USING WIDE LATITUDE TONER

Charles J. Voss, Addison, and Theodore Nykiel, Chicago, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 513,970, Oct. 11, 1974, Pat. No. 3,997,456, which is a continuation-in-part of Ser. No. 304,030, Nov. 6, 1972, abandoned. This application Aug. 23, 1976, Ser. No. 716,744
Int. Cl.[2] G03G *13/10*
U.S. Cl. 96—1 LY 6 Claims

1. The method of rendering visible the reverse sense electrostatic patterns contained on a surface in the form of negative electrostatic charges of varying intensity comprising contacting said surface with a liquid developer consisting of a carrier liquid having an electrical volume resistivity in excess of 10^9 ohm cm and a dielectric constant of less than 3, said liquid carrier having suspended therein non-resinated toner pigment particles, said liquid carrier having dissolved therein a sensitizing agent selected from the group consisting of ½% to 20% inclusive overbased calcium sulfonate in isoparaffinic hydrocarbon solvent and 15% to 25% inclusive nitrogen substituted long chain alkenyl succinamide in isoparaffinic hydrocarbon solvent, said toner particles including phthalocyanine green, carbon black, and thioindigoid red, and having a negative polarity whereby said toner particles are attracted to the area on said surface of no less than minimum of said electrostatic charge such that toner deposition takes place onto areas defined by said electrostatic pattern where the intensity of said negative electrostatic charges has been reduced or is zero by exposure to electromagnetic radiation, wherein said toner particles are milled in the presence of said sensitizing agent and a long oil soya modified pentaerythritol alkyd resin, whereby said toner particles become dispersed and have adsorbed thereon a film of said sensitizing agent.

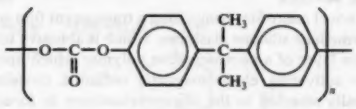
4,055,420

SINGLE PHASE ORGANIC PHOTOCONDUCTIVE COMPOSITION

William W. Limburg, Penfield, and Damodar M. Pai, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 27, 1977, Ser. No. 763,275
Int. Cl.[2] G03Q *5/06*
U.S. Cl. 96—1.5 N 6 Claims

1. An organic photoconductive composition consisting essentially of about 3.2 weight percent N-ethyl-3-tricyanovinylcarbazole, about 32.3 weight percent 2,5-bis(N,N-dimethylaminophenyl) oxadiazole and about 64.5% of a polycarbonate resin having recurring structural units represented by the formula



where *n* is in the range of from about 150 to about 400.

4,055,421

SENSITIZER FOR PHOTOCONDUCTIVE SENSITIVE MATERIAL

Masafumi Ohta, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Dec. 10, 1975, Ser. No. 639,417
Claims priority, application Japan, Dec. 12, 1974, 49-142736
Int. Cl.[2] G03G *5/04*
U.S. Cl. 96—1.6 2 Claims

1. A photoconductive material which comprises an organic photoconductor and 1,3,7-trinitrophenazine-5-oxide.

4,055,422

ADDITIVE FOR INHIBITOR REMOVING BATH

Bruce W. Wittnebel, and R. Dean Lowrey, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 28, 1975, Ser. No. 599,639
Int. Cl.[2] G03C *7/16, 5/32, 5/30*
U.S. Cl. 96—22 7 Claims

1. A composition of matter comprising a borohydride or borane complex anhydrously associated with an aldose.

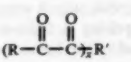
4,055,423

ORGANIC MEDIUM FOR THIN-PHASE HOLOGRAPHY

Robert Alfred Bartolini, Trenton, and Allen Bloom, East Windsor, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 15, 1976, Ser. No. 677,437
Int. Cl.[2] G03C *5/04*
U.S. Cl. 96—27 H 6 Claims

1. A method for recording permanent thin-phase holograms wherein holograms are recorded in only one plane which comprises changing with coherent light and without further development processing the refractive index in selected areas of a recording medium and detecting with coherent light the refractive index changes wherein the recording medium comprises a substrate having a recording layer thereon wherein the recording layer comprises an olefinically unsaturated negative photoresist polymer containing a soluble α-diketone which has the formula



wherein R and R' independently are selected from the group consisting of methyl, branched chain alkyl and cyclic hydrocarbon groups wherein the carbon atoms are part of an aromatic or aliphatic ring and R and R' together can form part of an aromatic or aliphatic ring; and *x* is an integer of 1 to 2.

4,055,424

NOVEL MICROFILM AND PROCESS FOR PREPARATION

Joseph Yung-Chang Chu, Fairport, and Richard Louis Schank, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 7, 1976, Ser. No. 684,323
Int. Cl.² G03C *1/71*
U.S. Cl. 96—35.1 **10 Claims**

1. A novel microfilm comprising a transparent film substrate, an intermediate silicone elastomer which is abhesive to ink and a surface layer of a photosensitive polymer which upon exposure to activating electromagnetic radiation crosslinks and chemically attaches to the silicone elastomer to form ink accepting image areas.

5. A process for providing a microfilm structure comprising:

a. providing a suitable transparent film substrate,

b. coating said substrate with an intermediate layer of a silicone elastomer gum curable or coalesceable to an ink releasing abhesive condition,

c. rendering said silicone inherently abhesive to ink,

d. coating said silicone with a surface layer of a photosensitive polymer which then exposed to actinic radiation crosslinks and combines with said silicone elastomer to form oleophilic ink accepting image areas,

e. imagewise exposing said photosensitive polymer to cause the polymer to become insoluble and combine with the silicone to form an image area

f. removing the non-exposed, light sensitive polymer to form non-imaged areas of the abhesive silicone elastomer, and

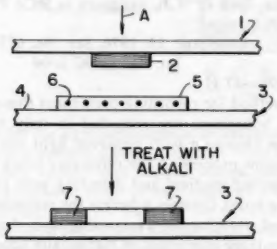
g. selectively inking the oleophilic image areas to form an imaged microfilm structure of improved image density and contrast.

4,055,425

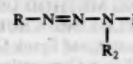
DIAZOTYPE MATERIAL AND GRAPHIC REPRODUCTION PROCESSES EMPLOYING THE SAME

Henry Mustacchi, London, England, assignor to GAF Corporation, New York, N.Y.

Filed Mar. 10, 1975, Ser. No. 556,971
Int. Cl.² G03C *1/58*
U.S. Cl. 96—49 **38 Claims**



1. A diazotype material, which comprises a supported light-sensitive layer comprising a light-sensitive, water-insoluble diazoimino compound of the formula reactive



wherein R is an aryl group and R_1 and R_2 are organic radicals, which may be the same or different, or R_1 and R_2 together with the nitrogen atom to which they are attached form a 4 to 7 membered heterocyclic group, an azo coupler, and an alkaline material, said diazoimino compound, when exposed to ultraviolet light, being reactive with said azo coupler to form a visible dye product only at a pH greater than 7.

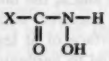
4,055,426

PROCESS FOR STABILIZING A COLOR DEVELOPING SOLUTION

Junkichi Ogawa; Tsumoru Ishii, and Isao Shimamura, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 27, 1976, Ser. No. 718,274
Claims priority, application Japan, Aug. 27, 1975, 50-103730
Int. Cl.² G03C *7/00, 5/30*
U.S. Cl. 96—66.4 **18 Claims**

1. A process for stabilizing a color developing solution containing one or more p-phenylenediamine derivatives which comprises adding one or more hydroxamic acid compounds represented by the following formula to the color developing solution:



wherein X represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an unsubstituted or substituted aryl group having 6 to 10 carbon atoms, an amino group, an alkylamino group having 1 to 4 carbon atoms or an arylamino group.

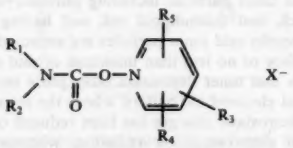
4,055,427

PROCESS OF HARDENING A SILVER HALIDE PHOTOGRAPHIC MATERIAL WITH A 1-CARBAMOYLOXYPYRIDINIUM SALT

Peter Bergthaller, Cologne; Wolfgang Himmelmann; Wolfgang Sauerteig, both of Leverkusen, and Lothar Rosenhahn, Cologne, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 551,069, Feb. 19, 1975, abandoned.
This application Feb. 15, 1977, Ser. No. 768,902
Claims priority, application Germany, Feb. 23, 1974, 2408814
Int. Cl.² G03C *1/30, 1/76*
U.S. Cl. 96—67 **11 Claims**

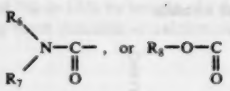
1. A process for providing a hardened layer in a photographic material containing a light sensitive silver halide emulsion layer and at least one layer containing a binder selected from the group consisting of gelatin and homopolymers and copolymers which contain carboxyl groups coated on a support wherein the improvement comprises applying to the binder-containing layer a hardening amount of a 1-carbamoyloxypyridinium salt of the formula



in which

R_1 represents a lower alkyl or aryl group,

R_2 represents a lower alkyl group or a group



in which

R_6 represents hydrogen, or a lower alkyl or aryl group,

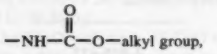
R_7 represents a lower alkyl group and

R_8 represents a lower alkyl group; or

R_1 and R_2 together represent the atoms required to complete a heterocyclic ring selected from the group consisting of pyrrolidine, morpholine-, piperidine-, perhydroazepine-, 1,2,3,4-tetrahydroquinoline- or imidazolidine-2-one ring, or

R_1 and R_2 together represent the atoms required to complete a piperazine ring in which the nitrogen that completes said piperazine ring is a member of the carbamoyl group of a second carbamoyloxypyridinium group,

R_3 represents hydrogen or halogen, or a lower alkyl, lower oxyalkyl, cyano, $CONH_2$ or



R_4 represents hydrogen or a lower alkyl group,

R_5 represents hydrogen or a lower alkyl group and represents an anion.

4,055,428

REDOX DYE RELEASERS O-SULFONAMIDOPHENOL

Koichi Koyama; Yukio Maekawa, and Masami Miyakawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

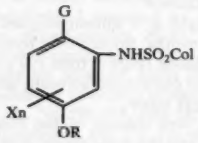
Filed Mar. 26, 1976, Ser. No. 670,763

Claims priority, application Japan, Mar. 28, 1975, 50-38305

Int. Cl.² G03C *1/40, 7/00, 1/76, 1/10*

U.S. Cl. 96—73 **28 Claims**

5. A photographic unit for a color diffusion transfer process comprising a support, a photosensitive element, an image-receiving element, and an aqueous and alkaline liquid processing composition, said photosensitive element comprising at least one silver halide emulsion layer having associated therewith a dye releasing redox compound represented by the general formula



wherein

G represents a hydroxyl group or a group giving a hydroxyl group upon hydrolysis,

Col represents a dye or a group giving a dye, both being diffusible when released upon hydrolysis;

R represents an alkyl group or an aromatic group,

X represents an electron donating group substituent when *n* is 1, or substituents, which may be the same or different, one of said substituents being an electron donating group and the second or second and third substituents being selected from the group consisting of an electron donating group or a halogen atom, wherein X groups may form a condensed ring, excluding an aromatic ring, with each other or with OR,

n is 1, 2 or 3 and the total carbon number of X_n and R is larger than 8.

4,055,429

INHIBITOR BARRIER LAYERS FOR PHOTOGRAPHIC MATERIALS

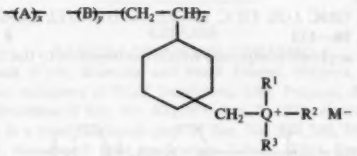
Edmund Thompson Holmes, and Gerald Allan Campbell, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 13, 1975, Ser. No. 631,800

Int. Cl.² G03C *1/76, 1/48, 1/84*

U.S. Cl. 96—74 **19 Claims**

1. A photographic element comprising a support having at least one layer containing a silver halide emulsion and at least one layer containing a development inhibitor scavenger, and wherein no acid dye or acid dye precursor is present, the improvement wherein said development inhibitor scavenger is a crosslinked polymer comprising units represented by the formula:



wherein

A is a polymerized monomer containing at least two ethylenically unsaturated groups;

B is a polymerized copolymerizable α, β-ethylenically unsaturated monomer;

Q is N or P;

R^1, R^2 and R^3 are independently selected from the group consisting of carbocyclic, alkyl, aryl and aralkyl and wherein R^1, R^2 and R^3 can, together with Q, form a heterocyclic ring;

M^- is an anion;

x is from about 0.25 to about 5 mole percent;

y is from about 0 to about 90 mole percent; and

z is from about 10 to about 99 mole percent.

4,055,430

LIGHT SENSITIVE MATERIAL CONTAINING AN ETHYLENE COMPOUND DYE FORMER, AN ORGANIC POLYMER COMPOUND CONTAINING CHLORINE AND A PLASTICIZER

Eiichi Hasegawa, and Kenichiro Yazawa, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

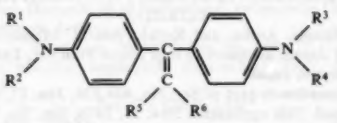
Filed May 17, 1976, Ser. No. 687,127

Claims priority, application Japan, May 15, 1975, 50-58281

Int. Cl.² G03C *1/52*

U.S. Cl. 96—90 R **10 Claims**

1. An image-forming light-sensitive composition consisting essentially of (a) an organic polymer compound containing chlorine, (b) a coloring matter-forming compound represented by the formula:



wherein R^1 through R^4 each represent a hydrogen atom, a lower alkyl group, or an aryl group, and R^5 to R^6 each represents a hydrogen atom, a lower alkyl group, or R^5 and R^6 combine with each other to form a 5- or 6-membered carbocyclic ring, and a plasticizing amount of a liquid plasticizer selected from the group consisting of a phthalic acid ester, a straight chain dibasic acid ester, a phosphoric acid ester, a

ricinolate derived from castor oil, an epoxide, of an unsaturated aliphate acid a tri- or tetraethylene glycol ester of a C_6 to C_{10} aliphatic acid, a polyester based plasticizer, a citric acid ester, a glycidyl ether, a glycol or polyhydric alcohol ester of acylic or methacrylic acid or a chlorinated paraffin hydrocarbon for said organic polymer containing chlorine and capable of dissolving the coloring matter-forming compound.

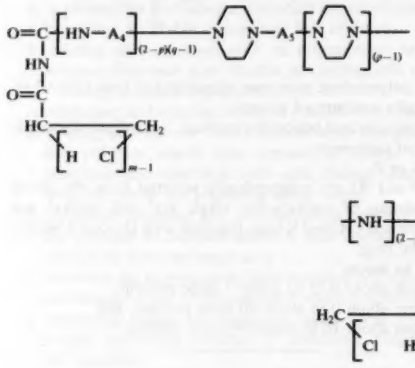
4,055,431

N(β-CHLORO-PROPIONYL OR ACRYLOYL)CARBAMYL OR UREIDO PIPERAZINES

Rolf Kyburz, Thun, Switzerland; Rainer Kitzing, Ilford, England, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 543,752, Jan. 24, 1975, Pat. No. 3,977,881.
This application Apr. 29, 1976, Ser. No. 681,304
Claims priority, application Switzerland, Jan. 31, 1974, 1332/74
Int. Cl.² G03C *1/30*; C07C *127/22*; C07D *295/12*; B65G *57/10*
U.S. Cl. 96—111 **8 Claims**

1. An acylurea compound which corresponds to the formula



wherein m is 1 or 2, p and q each denote one of the numbers 1 and 2 and A_4 and A_5 denote alkylene radicals with 1 to 4 carbon atoms.

4. Process for crosslinking hydrophilic colloids which contain amino, imino and/or hydroxyl groups, which comprises using as a crosslinking agent a compound of the composition indicated in claim **1.**

7. A hydrophilic colloid crosslinked by means of an acylurea compound as claimed in claim **1.**

8. A layer of a photograhic material crosslinked according to claim 7.

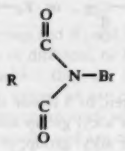
4,055,432

THERMODEVELOPABLE PHOTOGRAPHIC MATERIAL

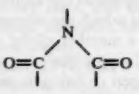
Takao Masuda, Asaka, and Keiichi Adachi, Minami-ashigara both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 434,326, Jan. 17, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,855
Claims priority, application Japan, Jan. 18, 1973, 48-8194
Int. Cl.² G03C *1/02, 1/34*
U.S. Cl. 96—114.1 **12 Claims**

1. A thermodevelopable photographic material comprising a support having thereon at least one layer containing (a) an organic silver salt, (b) a catalytic amount of a photosensitive silver halide or a compound capable of forming a photosensitive silver halide by reaction with the organic silver salt (a), (c) a reducing agent, (d) a binder, and (e) a compound having the following general formula



wherein R is a non-metallic atomic grouping necessary to form a heterocyclic ring containing at least 2 nitrogen atoms in the ring inclusive of the nitrogen in the



moiety in the above formula.

4,055,433

OIL-OUT SELF-SHINING EMULSION COATING COMPOSITION

Ricardo Morones, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Dec. 4, 1975, Ser. No. 637,544
Int. Cl.² C09G *1/04, 1/08*
U.S. Cl. 106—10 **9 Claims**

1. A water-in-oil emulsion coating composition comprising:

0.5–2% by weight of an ethoxylated nonionic surfactant having an ethylene oxide content of 40–100 moles of ethylene oxide having an HLB of from 16–19, said nonionic surfactant being formed from an alcohol selected from the group consisting of fatty alcohols and alkyl-aryl alcohols;

up to 30% by weight of a hard wax having a melt point above about 80° C.;

up to 30% by weight of a soft wax having a melt point below about 80° C.;

0.3–4% by weight of an emulsifier selected from oxazolines, imidazolines, quaternary ammonium compounds, fatty acid diethanolamides, mixtures of sorbitan monooleate and sorbitan moonooleate plus 20 moles of ethylene oxide, and mixtures thereof;

15–70% by weight of a solvent selected from the group consisting of naptha, isoparaffinic hydrocarbon solvents having a distillation range of from 190°–540° F., hydrocarbon ethers, and chlorinated solvents; and

20–75% by weight water;

wherein the total wax content of the composition is from 3–35% by weight and the non-volatile content is from about 4–40% by weight.

4,055,434

REFRACTORY FIBER COMPOSITION AND INTERMEDIATE TEMPERATURE RANGE FIBROUS INSULATION COMPOSED THEREOF

Alwin Bennett Chen, Littleton, and John Matthew Pallo, Englewood, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Apr. 23, 1976, Ser. No. 679,635
Int. Cl.² C03C *13/00*; C04B *35/14*
U.S. Cl. 106—50 **10 Claims**

1. A refractory fiber composition suitable for use as thermal insulation in temperature ranges of from 1400° F to 2000° F, which is formed from a melt consisting essentially of 84% to 97% by weight total silica and alumina, with the silica and

alumina being present in a silica-to-alumina weight in the range of 3:2 to 1:1, and 3% to 16% by weight of a dolomitic component comprising burnt dolomite or calcium oxide and magnesium oxide.

4,055,435

GLASS COMPOSITIONS FOR OPHTHALMIC LENSES

Hiroji Sagara, Akikawa, Japan, assignor to Hoya Glass Works, Ltd., Tokyo, Japan

Filed June 2, 1976, Ser. No. 692,074

Claims priority, application Japan, June 2, 1975, 50-66270; July 10, 1975, 50-84798

Int. Cl.² C03C *3/04, 3/08*

U.S. Cl. 106—52 **4 Claims**

1. A glass composition for an ophthalmic lens having a refractive index of at least 1.69, an Abbe value of at least 39 and a specific gravity of not more than 3.2 and consisting essentially of, in percent by weight:

1. 42 to 52 $SiO_2+Al_2O_3+B_2O_3$ with 20 to 42 SiO_2, 5 to 13 Al_2O_3 and 0 to 20 B_2O_3;
2. 22 to 39 CaO+MgO with 12 to 39 CaO and 0 to 20 MgO;
3. 15 to 28 $ZrO_2+TiO_2+Nb_2O_5$ with 0 to 7 ZrO_2, 5 to 13 TiO_2 and 0 to 15 Nb_2O_5;
4. 0 to 15 BaO+SrO+ZnO with 0 to 6 BaO, 0 to 10 SrO and 0 to 15 ZnO; and
5. 0 to 10 $La_2O_3+Ta_2O_5+WO_3$ with 0 to 10 La_2O_3, 0 to 6 Ta_2O_5 and 0 to 10 WO_3.

4,055,436

GLASS FOR MANUFACTURING WHITE-COLORED GLASS-CRYSTALLINE MATERIAL

Nikolai Mikheevich Pavlushkin, ulitsa Gotvalda, 20, kv. 15; Konstantin Timofeevich Bondarev, Nizhne-Pervomaiskaya ulitsa, 33, kv. 171, both of Moscow; Anatoly Vasilievich Strekalov, ulitsa Shmidta, 31, kv. 12, Konstantinovka Donetskoi oblasti; Viktor Stepanovich Kozlovsky, ulitsa Teatralnaya, 6a, Dolgoprudny Moskovskoi oblasti; Anatoly Gavrilovich Minakov, ulitsa Levanevakogo, 18, kv. 11; Tamara Efimovna Golius, ulitsa Pushkinskaya, 18, kv. 11, both of Konstantinovka Donetskoi oblasti; Ljudmila Alexeevna Orlova, ulitsa Kibalchicha, 2, korpus 3, kv. 20; Pavel Dzhibralovich Sarkisov, ulitsa Gotvalda, 20, kv. 3, both of Moscow; Mikhail Ivanovich Kozmin, ulitsa Shmidta, 31, kv. 6, and Vladimir Anatolievich Minakov, ulitsa Shmidta, 31, kv. 14, both of Konstantinovka Donetskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 599,601, July 28, 1975, abandoned, which is a continuation of Ser. No. 139,465, May 3, 1971, abandoned. This application Aug. 12, 1976, Ser. No. 713,896

Int. Cl.² C03C *3/04, 3/22*

U.S. Cl. 106—52 **1 Claim**

1. A glass for manufacturing white-colored glass-crystalline material, consisting essentially of, in per cent by weight:

SiO_2	48–60
Al_2O_3	5–8
CaO	20–30
MgO	0.8–2.5
MnO	0.5–1.5
Fe_3O_1	0.1–1
TiO_2	0.2–0.5
F_2	o.5–2
K_2O	4–7
Na_2O	up to 1.5 and
ZnS	less than 1.

4,055,437

METHOD OF IN SITU FABRICATION OF A MONOLITHIC REFRACTORY LINING

Daniel Ralph Petrak, N. Huntington, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 649,286, Jan. 15, 1976, abandoned. This application Mar. 23, 1977, Ser. No. 780,216

Int. Cl.² C04B *35/02*

U.S. Cl. 106—64 **4 Claims**

1. In a method of gunning refractory material on its situs of use with a minimum of rebounds to form a refractory monolith, which method includes the steps of preparing a refractory batch comprising non-basic refractory aggregate and calcium aluminate cement and tempering it, the improvement comprising mixing from about 0.5 to 25%, based upon the weight of the cement, of calcium chloride hydrate with the refractory batch and gunning the resulting batch.

4,055,438

BARIUM TITANATE CERAMIC

Shigetaka Wada, Kuwana, and Senji Atsumi, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Continuation of Ser. No. 431,397, Jan. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 256,368, May 24, 1972, abandoned. This application July 11, 1975, Ser. No. 594,967

Claims priority, application Japan, June 2, 1971, 46-37858

Int. Cl.² C04B *35/00, 35/46*

U.S. Cl. 106—73.32 **12 Claims**

1. A ceramic having a positive temperature coefficient of electric resistance, consisting essentially of:

100 parts by weight of four ingredients including

a. 1 mol of one barium titanate composition which is selected from the group consisting of barium titanate, 0.0001 to 0.35 mol of lead titanate and the remainder of barium titanate, 0.0001 to 0.4 mol of strontium titanate and the remainder of barium titanate, and 0.0001 to 0.15 mol of barium stannate and the remainder of barium titanate,

b. 0.003 to 0.05 mol of titania,

c. 0.003 to 0.05 mol of alumina, and

d. 0.005 to 0.06 mol of silica;

0.05 to 0.3 part by weight of at least one oxide selected from the group consisting of tantalum pentoxide and antimony pentoxide based on the preceding 100 parts by weight of ingredients (a) to (d); and

0.005 to 0.03 part by weight of at least one metal selected from the group consisting of manganese and copper based on the preceding 100 parts by weight of ingredients (a) to (d).

2. The ceramic according to claim **1**, wherein said barium titanate composition is 0.0001 to 0.35 mol of lead titanate and the remainder of barium titanate.

4,055,439

PROCESS FOR THE MANUFACTURE OF DUSTLESS, READILY DISPERSIBLE PIGMENT GRANULES

Fridolin Babler, Allschwil; Hans Mollet, Reinach, and Gunther Zwahlen, Dornach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,617

Claims priority, application Switzerland, Sept. 13, 1974, 12519/74

Int. Cl.² C08K *5/00*

U.S. Cl. 106—288 Q **15 Claims**

1. A process for the manufacture of an easily isolatable, dustless, readily dispersible pigment granulate, which comprises gradually adding, at a temperature between 10°–35° C under turbulent mixture, to a suspension of 10 parts of a finely dispersed organic pigment or pigment preparation in 10–700 parts of water 2-22 parts of an organic solvent being virtually insoluble in water, and having dissolved 0.1-2.5 parts of water-

insoluble granulating assistants belonging to the class of natural, synthetic or semi-synthetic resins, esters of dicarboxylic acids, of arylcarboxylic acids, of arylsulphonic acids, of phosphoric and phosphorous acid, phenylsulphonamides or the alkaline salts of fatty acids containing 12 to 14 carbon atoms but, in the absence of wetting agents whereby a granulate is formed, then isolating said granulate, which consists substantially of pigment or pigment preparation, granulating assistant and organic solvent, and removing the solvent therefrom.

4,055,440

PIGMENT COMPOSITIONS

Ian Robert Wheeler, Houston, and George Heddle Robertson, Paisley, both of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 2, 1976, Ser. No. 720,029

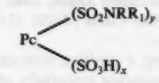
Claims priority, application United Kingdom, Sept. 9, 1975, 37106/75

Int. Cl.[2] C08K *5/34*

U.S. Cl. 106—288 Q **6 Claims**

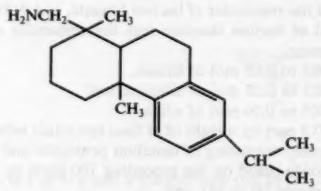
1. A phthalocyanine pigment composition comprising a phthalocyanine pigment and a sulphonated phthalocyanine derivative formed from sulphonated phthalocyanine dyestuffs having the formula:

I



and a sufficient quantity of dehydroabietylamine having the formula

II



to substantially neutralise the free sulphonic acid groups, wherein R represents a $C_1 - C_{22}$ cyclic or acyclic alkyl group, aryl, aralkyl group or a dehydroabietylamine residue; and R_1 represents hydrogen or a $C_1 - C_{22}$ cyclic or acyclic alkyl group, an aryl or an aralkyl group; the alkyl, cycloalkyl, aryl or aralkyl groups, R and R_1 may be optionally substituted with one or more hydroxyl groups; x is from 1 to 4, y is 0 or from 1 to 3 and the sum of $x + y$ is from 1 to 4, and wherein the ratio of phthalocyanine pigment to sulphonated phthalocyanine dyestuff is from 80:20 to 99:1 by weight.

4,055,441

PROCESS FOR RECOVERING, RECYCLING AND REUSING A COMPOSITE CONTAINER

Lynn Johnston Taylor, and Henry Neal Troy, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 541,416, Jan. 16, 1975, which is a continuation-in-part of Ser. No. 189,450, Oct. 14, 1971, abandoned. This application Dec. 6, 1976, Ser. No. 747,753

Int. Cl.[2] B08B *7/34*; B05B *1/40*

U.S. Cl. 134—10 **5 Claims**

1. A process for the preparation of a coated annealed glass container and recovering, recycling and reusing the glass container in the manufacture of a further glass container comprising applying a film to at least a portion of the external surface of a previously annealed glass container; said film consisting essentially of a water removable thermoplastic organic polymer and having a thickness of at least 0.002 inch and sufficient to provide scratch and shatter resistance for the glass container and to retain broken glass fragments upon fracture of the glass container so as to reduce the incidence of accidental injury; said polymer being water soluble or dispersible and being selected from the group consisting of poly(ethylene oxide), poly (propylene oxide), ethylene oxide-propylene oxide copolymers, polyvinyl-pyrrolidinone, polyethyleneimine, poly(methyl vinyl ether), polyacrylamide, polymethacrylamide, poly(vinyl acetate), polyvinyl formal, poly(alkyl methacrylates), methyl cellulose, ethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, sodium carboxymethyl cellulose, methyl hydroxypropyl cellulose, poly (acrylic acid) and salts thereof, poly(methacrylic acid) and salts thereof, ethyene-maleic anhydride copolymers, ethylene-vinyl alcohol copolymers, ethylene-acrylic acid copolymers, vinyl acetate-vinyl alcohol copolymers, methyl vinyl ether-maleic anhydride copolymers, and emusifiable polyurethanes; subjecting at least said external surface of said film to an aqueous medium to remove said film therefrom and recovering, recycling and reusing said glass container in the manufacture of a further container.

4,055,442

SILICON SOLAR CELL CONSTRUCTION HAVING TWO LAYER ANTI-REFLECTION COATING

Frederick K. Crosher, Santa Rosa, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Jan. 19, 1976, Ser. No. 650,258

Int. Cl.[2] H01L *31/06*

U.S. Cl. 136—89 CC **3 Claims**

1. In a silicon solar cell construction, a body formed essentially of silicon having a surface with a photovoltaic junction applied thereon, an anti-reflection coating formed on said surface, a transparent protective cover and a layer of substantially transparent cement securing said protective cover to said anti-reflection coating and to said body, said cover and said cement having indices of refraction of approximately 1.45, and approximately 1.4, respectively, said anti-reflection coating being formed of first and second layers, said first layer being formed of material having a high index of refraction which is less than that of silicon ranging from 2.35 to 2.4 and being closer to said silicon body than said second layer said second layer being formed of a material having a low index of refraction which is greater than that of the cement but less than that of said first layer ranging from 1.6 to 1.7.

2. A silicon solar cell construction as in claim **1** wherein said high index material is an oxide of titanium and wherein said low index material is an oxide of aluminum.

4,055,443

METHOD FOR PRODUCING SEMICONDUCTOR MATRIX OF LIGHT-EMITTING ELEMENTS UTILIZING ION IMPLANTATION AND DIFFUSION HEATING

Jury Stepanovich Akimov, ulitsa Kosmonavtov, 4, kv. 30; Valery Petrovich Sushkov, ulitsa Onezhskay, 45/19, kv. 123, and Vladimir Ivanovich Kurinny, ulitsa Vavilova, 58, korpus 2, kv. 90, all of Moscow, U.S.S.R.

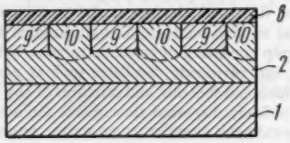
Filed June 19, 1975, Ser. No. 588,465

Int. Cl.[2] H01L *21/265, 21/324, 21/76*

U.S. Cl. 148—1.5 **1 Claim**

1. A method for producing a semiconductor array of light-

emitting elements using an epitaxial structure consisting of a substrate GaAs of the p^+-type of conductivity with layers of $Ga_{1-x}Al_xAs$ of the p-type and $Ga_{1-y}Al_yAs$ of the n-type of conductivity applied successively onto it, said layers forming a light-emitting p-n junction, comprising the steps of producing at first a photoresist mask on said n-type layer of said epitaxial structure, said mask protecting portions of said n-type layer which correspond to a required configuration and size of said



light-emitting elements; introducing next an acceptor addition through said mask and said n-type layer by means of ion implantation, removing said photoresist mask; applying onto the uncovered n-type layer a layer of SiO_2; diffusion heating next for a time and at a temperature sufficient to produce in the n-type layer, under portions that were not protected by said mask, p-type areas whose depth is equal to at least the thickness of said n-type layer.

4,055,444

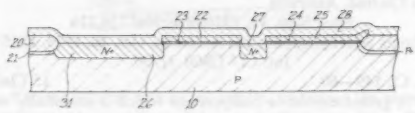
METHOD OF MAKING N-CHANNEL MOS INTEGRATED CIRCUITS

G. R. Mohan Rao, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 12, 1976, Ser. No. 648,593

Int. Cl.[2] H01L *21/26*

U.S. Cl. 148—1.5 **9 Claims**



1. A method of making N-channel, silicon-gate MOS integrated circuit devices of the type having memory cells therein, comprising the steps of:

growing a thin uniform silicon oxide coating over an entire surface of a monocrystalline silicon slice;

covering the thin silicon oxide coating with a thin uniform layer of silicon nitride;

removing the silicon nitride coating in a pattern to expose selected areas of the thin silicon oxide coating;

implanting a first conductivity-type determining impurity into shallow surface-adjacent regions of the silicon in said selected areas by exposing the slice to an ion beam, such implanting being done through said thin silicon oxide coating;

subjecting the slice to an elevated temperature of at least about 1000° C for at least about ½ hour in an inert atmosphere to reduce the damage to the crystalline structure of the silicon beneath said exposed selected areas caused by the ion beam and to raise the concentration of the first impurity in the silicon below said surface-adjacent regions;

oxidizing the slice at a temperature below said elevated temperature for a time greatly exceeding that used in the prior step to create a thick silicon oxide coating in said exposed selected areas;

removing the remaining silicon nitride from the surface of the slice; and

forming MOS transistors and oxide-dielectric capacitors for said memory cells on said slice by diffusing or implanting into the slice second conductivity-type determining impurity of opposite type from the first impurity, the regions in the slice created by the first impurity being contiguous to that formed by the second impurity at least in the areas substantially surrounding the capacitors.

4,055,445

METHOD FOR FABRICATION OF BRASS ALLOY

Horace Pops, Fort Wayne, Ind., assignor to Essex International, Inc., Fort Wayne, Ind.

Continuation-in-part of Ser. No. 508,098, Sept. 20, 1974, Continuation of Ser. No. 107,118, Jan. 18, 1971, abandoned, Continuation of Ser. No. 580,804, May 27, 1975, Continuation of Ser. No. 311,218, Dec. 1, 1972, abandoned, Division of Ser. No. 107,118, Jan. 18, 1971, abandoned. This application Nov. 20, 1975, Ser. No. 633,580

Int. Cl.[2] C22F *1/08*

U.S. Cl. 148—11.5 C **6 Claims**

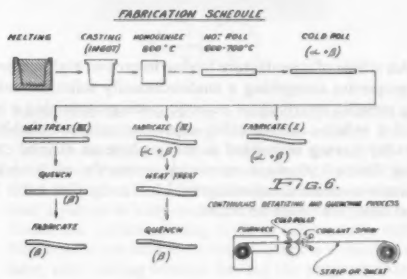


FIG. 6.

1. A method for making an improved ternary brass alloy that includes silicon as an additive material comprising the steps of:

preparing a substantially homogeneous, polycrystalline mix of 25% to 40% by weight zinc, 0.25% to 3.0% by weight silicon and the balance copper;

alternately cold rolling and intermediate annealing said alloy;

said annealing being in the range of 400° C. to 550° C. to soften said alloy and produce a continuous matrix of alpha phase material with uniformly distributed beta phase material including a minimum of about 25% beta phase material and a maximum of about 75% alpha phase material during said anneal.

4,055,446

SALT BATH QUENCHING OF CONSTRUCTION PARTS TREATED WITH A NITRIDING BATH

Helmut Kunst, and Christian Scondo, both of Hanau, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Mar. 25, 1976, Ser. No. 670,154

Claims priority, application Germany, Apr. 2, 1975, 2514398

Int. Cl.[2] C21D *1/48*

U.S. Cl. 148—15 **12 Claims**

1. In a process of tempering an iron or steel part that has been treated initially in (1) a low cyanide, high cyanate nitriding bath, (2) a cyanide free, high cyanate nitriding bath or (3) a high cyanide nitriding or carburiding bath, the improvement comprising taking the part containing entrained cyanide or cyanate from said bath and placing it in a tempering bath having a temperature of 190° to 580° C and keeping the part in the tempering bath until the entrained cyanide or cyanate is substantially completely decomposed, said bath consisting of at least one alkali metal hydroxide with 2 to 20% of at least one alkali metal nitrate based on the total weight of the tempering bath.

4,055,447
DIRECTIONALLY SOLIDIFIED EUTECTIC γ-γ' NICKEL-BASE SUPERALLOYS

Melvin R. Jackson, Schenectady, N.Y., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 7, 1976, Ser. No. 684,171
Int. Cl.² C22C *19/03*
U.S. Cl. 148—32 **13 Claims**

1. An article of manufacture having improved high temperature properties comprising a unidirectionally solidified anisotropic metallic mutrivariant eutectic casting containing a matrix of a γ-face-centered-cubic crystal structure nickel-base superalloy having embedded in the γ phase an aligned reinforcing fibrous γ' phase consisting primarily of a nickel-aluminum-tantalum composition which is a complex cubic $L1_2$ crystal structure based on Ni_3Al.

4,055,448
FERRITE-AUSTENITE STAINLESS STEEL

Masakuni Fujikura, Nagoya, and Naohiro Abe, Chita, both of Japan, assignors to Daido Seiko Kabushiki Kaisha, Nagoya, Japan

Continuation-in-part of Ser. No. 459,364, April 9, 1974, abandoned. This application May 14, 1976, Ser. No. 686,598
Claims priority, application Japan, Apr. 10, 1973, 48-40607; Jan. 29, 1974, 49-12405
Int. Cl.² C22C *38/42*
U.S. Cl. 148—38 **3 Claims**

1. An improved stainless steel in ferrite-austenite condition said ferrite-austenite condition being produced by solution heat treatment at a temperature of 1000 ° –1150 ° C, and composed of, by weight percent, carbon up to 0.06%, silicon up to 1.0%, manganese up to 1.5%, nickel from 3.0% to 7.0%, chromium from 21.0% to 28.0%, copper up to 3.0%, molybdenum from 1.0% to 4.0%, boron from 0.0008% to 0.0080%, niobium from 0.08% to 0.7%, titanium from 0% to 0.5%, tantalum from 0% to 0.5%, zirconium from 0% to 0.5%, nitrogen up to 0.1%, and the remainder of iron and an inevitable amounts of impurity, with the values of nickel equivalent and chromium equivalent calculated by the following equations:

nickel equivalent = 40 (carbon % + nitrogen %) +3 (nickel %) + (copper %) +2 (manganese %)

chromium equivalent = (chromium %) + 5.2 (silicon %) +4.2 (molybdenum %) + 4.5 (niobium %) +7.0 (titanium %) + 3.0 (tantalum %) +13.0 (zirconium %)

satisfying the relationship below:

nickel equivalent = from 15 to 30

chromium equivalent = from 28 to 50

chromium equivalent — nickel equivalent = from 8 to 27.

4,055,449
AQUEOUS BLASTING COMPOSITION WITH CRYSTAL HABIT MODIFIER

Daniel A. Wasson, Sandy City, Utah, assignor to Ireco Chemicals, Salt Lake City, Utah

Filed Aug. 11, 1976, Ser. No. 713,557
Int. Cl.² C06B *45/00*
U.S. Cl. 149—2 **20 Claims**

1. In an aqueous blasting composition having a continuous aqueous phase and comprising inorganic oxidizer salt, liquid hydrocarbon fuel, and thickener; the improvement which comprises (a) an immiscible liquid hydrocarbon fuel selected from the group consisting of benzene, toluene, xylene, tall oil, paraffin oil, and petroleum distillates such as gasoline, kerosene, diesel fuels and fuel oils, and mixtures of any two thereof, which fuel is finely dispersed throughout the aqueous phase, and (b) a crystal habit modifier to reduce the crystal size of the oxidizer salt and thereby stabilize the fine dispersion of the immiscible liquid hydrocarbon fuel throughout the composition.

10. A method of sensitizing an aqueous blasting composition having a continuous aqueous phase; oxidizer salt at least partially dissolved in the aqueous phase; thickener; and immiscible liquid hydrocarbon fuel selected from the group consisting of benzene, toluene, xylene, tall oil, paraffin oil, and petroleum distillates such as gasoline, kerosene, diesel fuels and fuel oils, and mixtures of any two thereof, which fuel is finely and stably dispersed throughout the aqueous phase; which method includes the steps of adding to the aqueous phase, at a temperature above the crystallization temperature of the oxidizer salt in the phase, a crystal habit modifier and allowing the composition to cool.

4,055,450
EXPLOSIVE COMPOSITION CONTAINING AMINE SOLVATING AGENT

Vladimir Sujansky, Burwood, Australia, assignor to ICI Australia Limited, Australia

Filed Sept. 17, 1976, Ser. No. 724,214
Claims priority, application Australia, Oct. 10, 1975, 3535/69
Int. Cl.² C06B *31/30*
U.S. Cl. 149—60 **15 Claims**

1. A gelled explosive composition which is essentially non-aqueous comprising firstly from 50 to 90% w/w of inorganic oxygen releasing salt material selected from the group consisting of the nitrate, chlorate and perchlorate of the group consisting of the alkali metals, the alkaline earth metals and ammonium; secondly from 0 to 5% w/w of water; thirdly from 0.1 to 5% w/w of gum selected from the group consisting of galactomannan gums and derivatives thereof; and fourthly as a solvating agent for said gum from 1 to 30% w/w of an amine in liquid from.

4,055,451
COMPOSITE MATERIALS

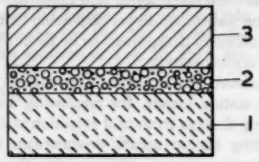
Alan Gray Cockbain, Inglewood Church Road, Evenley, near Brackley, Northamptonshire, England; Michael John Latimer, 355, Birchfield Road East, Northampton, Northamptonshire, England, and Norman Lawrence Parr, 2, Surbiton Court, St. Andrews Square, Surbiton, Surrey, England

Division of Ser. No. 501,439, Aug. 28, 1974, abandoned. This application May 21, 1976, Ser. No. 688,556
Claims priority, application United Kingdom, Aug. 31, 1973, 41189/73
Int. Cl.² C04B *35/64, 37/02*
U.S. Cl. 156—89 **5 Claims**

1. A method of making a ceramic/metal composite, the method of comprising the steps of:

1. **Sintering ceramic granules onto at least a part of the surface of a ceramic body to form a porous layer thereon.**
2. Heating a metallic member to a temperature just below its melting point, and

3. Hot-pressing the said metallic member onto the said porous layer until the said metallic member is at least par-



tially infiltrated into, and is interlocked with, the pores of the said porous layer.

4,055,452

METHOD AND APPARATUS FOR SEVERING AND EDGE-SEALING THERMOPLASTIC FILMS, AND PRODUCT

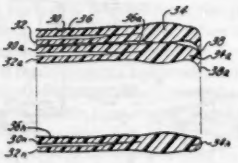
Richard S. Carlisle, P.O. Box 307, Rye, N.Y. 10580

Continuation of Ser. No. 326,278, Jan. 24, 1973, Pat. No. 3,933,563, and a continuation-in-part of Ser. No. 256,850, May 25, 1972, abandoned. This application Jan. 19, 1976, Ser. No. 650,468

The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—251 **7 Claims**



1. The method of making an article, including the steps of assembling at least one set of thermoplastic heat-sealable films, each film of said set having heat-sealable material that tends to become thickened when exposed to heat-sealing temperature and the assembled films of said set having their heat-sealable materials disposed against each other, heating a blade well above the fusion temperature of the heat-sealable material, applying the blade with pressure against one face of the assembled films while so heated and while supporting the films opposite the edge of the blade against such pressure, the amount of pressure and the sharpness of the blade being less than that needed to effect die-cutting of the films in the absence of film-fusing heat, the blade thus providing severed edges of the films, and holding said films of each set together and heating to heat-sealing temperature marginal portions of the films along the severed edges far greater in width than the combined initial thickness of the set of films and thereby forming a wide marginal seal, said heating of the marginal portions of the films being effected both by exposing the films to the heated blade as aforesaid during severing and by subjecting at least one face of said set of films over the width of said marginal portions to heat-sealing temperature that diminishes progressively away from the blade to and beyond a juncture where the unsealed films merge into the marginal seal, said holding being accomplished with pressure limited so as to accommodate substantial thickening of at least part of the width of the seal, whereby the seal formed between the films of said set is of substantially greater thickness than the initial thickness of the set of films, said greater thickness extending across the seal outward from said juncture for a distance greater than said initial thickness.

4,055,453

PROCESS FOR PRODUCING LAMINATED BITUMINOUS ROOFING MEMBRANE

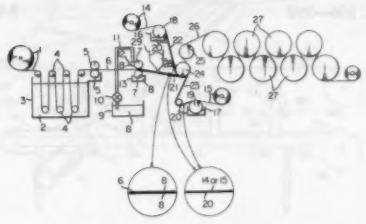
Eiichi Tajima; Kaname Yamamoto, and Takayoshi Imai, all of Tokyo, Japan, assignors to Tajima Roofing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 331,602, Feb. 12, 1973, abandoned. This application May 8, 1975, Ser. No. 575,539

Claims priority, application Japan, Feb. 19, 1972, 47-016906

Int. Cl.[2] B32B *7/10*; C09J *3/30, 5/04*

U.S. Cl. 156—279 **15 Claims**



1. A process for producing a self-adhesive, multi-layer, laminated, bituminous, roofing membrane suitable for cold application to a substrate, which comprises the step of:

a. continuously moving a continuous web of a flexible base sheet through a first coating device and therein coating at least a part of at least one surface of said base sheet with a continuous surface coating layer of substantially uniform thickness of hot molten roofing bitumen in a viscous liquid state, said roofing bitumen having the property that it is substantially solid at amibient application temperature to form a waterproof layer on said base sheet;

b. separately from step (a) but simultaneously therewith, continuously moving a continuous web of a flexible release sheet through a second coating device and therein coating substantially the entirety of only one releasable surface of said release sheet with a continuous surface coating layer of substantially uniform thickness of hot molten compound bitumen in a viscous liquid state, said compound bitumen consisting essentially of bitumen and about 5 to 95 percent by weight of substance selected from the group consisting of rubber, thermoplastic resin and mixtures thereof, said compound bitumen having the property that it possesses a high tackiness at ambient application temperature;

c. immediately after steps (a) and (b) and while said surface coating layers on the coated webs obtained in steps (a) and (b) are still in a molten state, continuously conjointly moving said coated webs around and in supported relationship on a circumferentially elongated portion of the periphery of a roller with one of said coated webs being disposed with its sheet in surface contact with said circumferentially elongated portion of the periphery of said roller and with its surface coating layer facing outwardly away from said roller and with the other of said coated webs having its surface coating layer disposed in face-to-face opposing relationship to said surface coating layer of said one coated web and with its sheet being disposed outwardly therefrom, and drawing said other web into contact with said one web and thereby uniting said surface coating layers in direct face-to-face contact as said webs move together around said circumferentially elongated portion of said roller, said uniting of said surface coating layers being effected in the absence of an external compression force applied to the sheet of said other web whereby to form a unitary roofing membrane consisting essentially of the products of steps (a) and (b) wherein said coating layers are between said base sheet and said release sheet and are united thereto and to each other; and then

d. continuously moving said unitary roofing membrane

through a cooling device whereby to solidify said coating layers.

4,055,454

PROCESS FOR FORMING PEELABLE SEALS

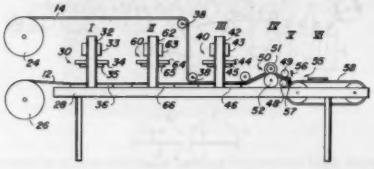
Louis Lawrence Laske, Grayslake, Ill., assignor to Vonco Products, Inc., Lake Villa, Ill.

Continuation-in-part of Ser. No. 499,621, Aug. 22, 1974, Pat. No. 3,926,311. This application Dec. 15, 1975, Ser. No. 641,151

The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.[2] A61B *19/02*

U.S. Cl. 156—290 **9 Claims**



1. A method for forming peelable seals between uncoated spunbonded olefin sheet material and a synthetic polymeric thermoplastic sheet material comprising maintaining a substantial portion of said spunbonded olefin sheet untreated and breathable, modifying the surface of the spunbonded olefin sheet in the area of the desired peelable seal by pretreatment with heat and pressure to sbustantially eliminate high spots and internal weaknesses to render the sealing area susceptible to having said synthetic polymeric thermoplastic material peelably joined thereto in said pretreated area by conventional heat-pressure sealing, and peelably sealing said pretreated spunbonded olefin sheet to said synthetic polymeric thermoplastic sheet material by conventional heat-pressure sealing only in said pretreated area.

4,055,455

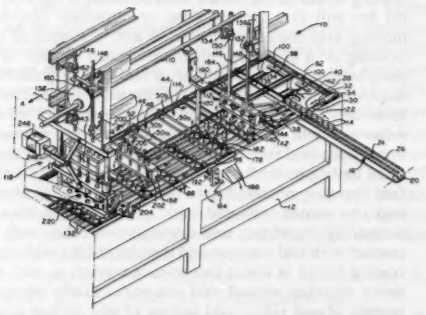
APPARATUS FOR LINING AND TESTING CONTAINER CLOSURES

Walter McDonald, Landing; Norbert F. Seitel, Gillette, and Richard A. Burger, Pompton Lakes, all of N.J., assignors to Norwalt Design, Inc., Whippany, N.J.

Filed July 26, 1976, Ser. No. 708,691

Int. Cl.[2] B65C *9/40*; G01M *3/32*

U.S. Cl. 156—351 **22 Claims**



1. Apparatus for lining and testing container closures comprising in combination:

means for forming an infeed stream of said closures;

means interacting with closure stream for forming groups of closures;

conveyor means for accepting said closure groups and conveying said groups through said apparatus as a plurality of parallel moving processing lines of closures;

shell integrity test station means in said processing lines for testing the shell integrity of said closures;

first rejection station means for displacing from said processing lines closures determined to be defective at said shell integrity testing station;

seal emplacement station means downstream from said first rejection station means, for emplacing seals in closures proceeding thereto from said rejection station;

sealing testing station means downstream from said seal emplacement station means for testing the sealing characteristics of closures proceeding thereto;

second rejection station means downstream of said sealing testing station means, for rejecting closures determined to be defective at said sealing testing station means; and

discharge station means downstream of said second rejection station means, for receiving closures successfully proceeding past said second rejection station means.

4,055,456

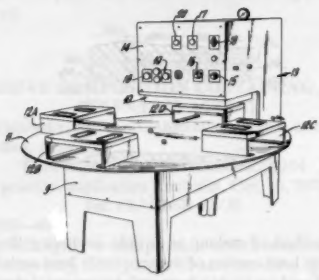
IMPULSE HEAT-SEALING MACHINE

Frank Carnegie, Jr., Montville, N.J., assignor to Camid Intermatic, New York, N.Y.

Filed Aug. 4, 1976, Ser. No. 711,597

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—366 **8 Claims**



1. A machine for sealing together and severing two or more plastic resin films, comprising:

a base plate upon which the films are positioned;

a platen movable relative to the base plate and movable toward and away from the films on the base plate;

compression means to press said platen toward said films at selected times;

a sealing die mounted on said platen and comprising a heat resistant and electrically insulative rigid substrate, a heat sealing element of etched metal foil having a uniform thickness bonded to said substrate, the width of said heat sealing element being many times its thickness and being sufficiently wide and at least one-sixteenth inch in width to form a liquid leakproof seal of said films, said heat sealing element having a curved portion to form a curved seal, a non-stick layer covering said heat sealing element;

control means connecting said heater element to a source of voltage for selected short times of less than 5 seconds for impulse resistance heating of said sealing element;

an electrical resistance knife mounted on said platen and close to said heat sealing element to sever the films by melting, said knife having a curved edge parallel to the curve of said heat sealing element to sever said films along a curved line;

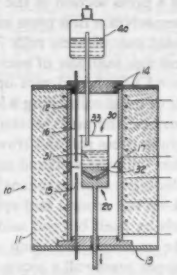
means connecting said knife to a source of voltage to heat said knife and thereby melt and sever said film.

4,055,457

METHOD FOR GROWING ABSORPTION-FREE ALKALI METAL HALIDE SINGLE CRYSTALS

Carl F. Swinehart, University Heights, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 434,364, Jan. 17, 1974, abandoned. This application Aug. 20, 1976, Ser. No. 716,051
Int. Cl.[2] B01J *17/06, 17/08;* C01D *3/04, 3/10*
U.S. Cl. 156—616 R 4 Claims



1. In a Stockbarger or Kyropoulos method of growing an essentially single crystal ingot from a melt consisting of a bromide, chloride or mixture thereof, of an alkali metal of Group 1A of the Periodic Table, said melt contaminated with a silicate impurity, the improvement comprising confining said melt in a siliceous crucible, contacting said melt with a metal silicate-forming scavenger selected from the group consisting of (a) a bromide of a Group IIA metal when said melt is predominantly a bromide, (b) a chloride of a Group IIA metal when said melt is predominantly a chloride, and (c) a rare earth metal selected from europium, ytterbium and samarium added to said melt in melt-soluble form, reacting said scavenger with the silicate impurity in said melt, and removing the silicate impurity by depositing the same as a coating on the crucible to produce an ingot free of infrared absorption due to silicate impurity.

4,055,458

ETCHING GLASS WITH HF AND FLUORINE-CONTAINING SURFACTANT

Hans Niederprum, Monheim; Heinz Günter Klein, Cologne, and Johann-Nikolaus Meussdoerffer, Blecher, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 30, 1976, Ser. No. 709,995
Claims priority, application Germany, Aug. 7, 1975, 2535333; Dec. 15, 1975, 2556429
Int. Cl.[2] C03C *15/00, 25/06*
U.S. Cl. 156—663 3 Claims

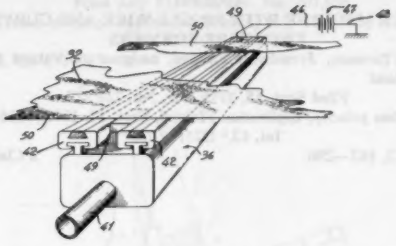
1. In the etching of glass wherein glass is contacted with an aqueous etching bath containing hydrofluoric acid, and the glass is thereafter removed from the bath and rinsed, the improvement which comprises dissolving in the etching bath an acid-resistant quaternary ammonium perfluoroalkane sulfonate wetting agent of the formula $R_fSO_3^- NR^1R^2R^3R^4+$, wherein R_f is a linear or branched aliphatic perfluoroalkyl radical with from 6 to 12 carbon atoms, and R^1, R^2, R^3 and R^4 each independently is an alkyl or aralkyl radical of up to 18 carbon atoms, or two or three of R^1, R^2 and R^3 are attached to form a ring through the nitrogen atom.

4,055,459

METHOD AND APPARATUS FOR PREVENTING THE ADHERENCE OF POLARIZED FOREIGN PARTICLES TO PAPER MACHINE COMPONENTS

Francis Brian Best, Pointe Claire, Canada, assignor to JWI Ltd., Canada

Filed June 28, 1976, Ser. No. 700,520
Int. Cl.[2] D21F *1/52, 1/54*
U.S. Cl. 162—192 10 Claims



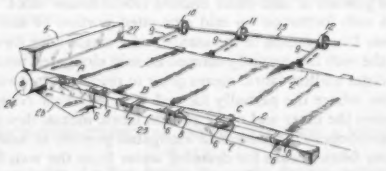
1. A method of preventing the accumulation of polarized foreign particles on a fabric support surface of support elements positioned in contact with a moving fabric in a papermaking machine on which there is supported a pulp stock having polarized foreign particles comprising connecting an electrical charge to a conductive portion of said support elements, said electrical charge being of like polarity to said polarized foreign particles whereby said polarized foreign particles will be repelled from at least a portion of said fabric support surface.

4,055,460

PAPER MACHINE SHAKE

John Gordon Buchanan, Pointe Claire, Canada, assignor to JWI Ltd., Montreal, Canada

Continuation of Ser. No. 667,947, March 18, 1976, abandoned, which is a continuation of Ser. No. 495,777, Aug. 8, 1974, abandoned. This application Dec. 23, 1976, Ser. No. 753,791
Int. Cl.[2] D21F *1/20*
U.S. Cl. 162—209 19 Claims



10. The method of producing paper and ensuring a uniform repetitive quality of the paper comprising the steps of:

providing a paper making machine with a Fourdrinier section having an endless forming fabric belt which has an upper stock carrying run having a natural frequency of lateral vibration;

depositing paper stock on the upper run of the endless belt;

determining the natural frequency of the upper stock carrying run of the endless fabric belt;

driving the endless belt in the machine direction while depositing wet paper making stock at the upstream end of the fabric;

providing at least one foil member, having a continuous, uninterrupted, flat top supporting surface portion over the entire length thereof, and disposing the foil member such that the top surface portion is in frictional engagement with the under surface of the upper run of the endless fabric belt;

applying a lateral force on the under surface of the upper run of the endless fabric belt by vibrating the foil member in a cross machine direction to thereby cause the upper run of said endless fabric belt to vibrate uniformly;

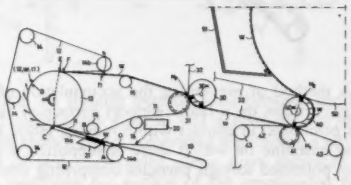
characterized in that the foil member is vibrated at a frequency harmonically related to a frequency substantially equal to the said natural frequency of the stock carrying upper run of the belt.

4,055,461

PAPER MACHINE WITH SINGLE-WIRE AND CURVED TWIN-WIRE FORMERS

Risto Turunen, Jyvaskyla, Finland, assignor to Valmet Oy, Finland

Filed Sept. 15, 1976, Ser. No. 723,225
Claims priority, application Finland, Sept. 17, 1975, 752603
Int. Cl.[2] D21F *9/00*
U.S. Cl. 162—290 **2 Claims**



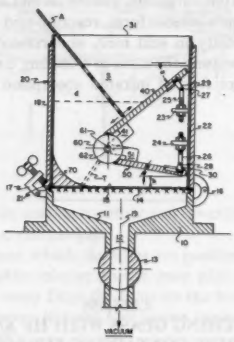
1. In a paper machine, inner and outer endless fabric means and a smooth forming roll around which said inner and outer fabric means are lapped with said inner endless fabric means situated between said outer endless fabric means and said forming roll and forming with said outer endless fabric means a twin-wire former where said inner and outer fabric means are lapped around said forming roll, said outer endless fabric means having an elongated portion situated in advance of the twin-wire former and spaced from said inner endless fabric means while travelling with the latter toward said smooth forming roll to meet said inner endless fabric means at said forming roll to form therewith the initial part of the twin-wire former, headbox means cooperating with said elongated portion of said outer endless fabric means which is situated in advance of said twin-wire former for depositing on said elongated portion of said outer endless fabric means stock which starts web formation on said elongated portion of said outer endless fabric means in the manner of a single-wire former so that the web has partially formed on said elongated portion of said outer endless fabric means prior to reaching the twin-wire former where the partially formed web is further compacted between the inner and outer endless fabric means, dewatering means cooperating with said elongated portion of said outer endless fabric means for draining water from the web formed on said elongated portion of said outer endless fabric means to an extent greater than if said dewatering means were not utilized, whereby the web reaches the twin-wire former in a condition according to which the web has dried to a substantial extent beyond that resulting only from gravitational watering at said elongated portion of said outer endless fabric means, with the drainage from the web being continued at the twin-wire former due to centrifugal force outwardly through the outer endless fabric means, whereby the web is gradually dried until reaching the end of the twin-wire former distant from said elongated portion of said outer endless fabric means, said inner and outer endless fabric means again becoming spaced from each other at the latter end of said twin-wire former and said smooth forming roll transferring the web to said inner endless fabric means for travel therewith beyond said twin-wire former due to the normal table roll effect, and pick-up means cooperating with said inner endless fabric means at a portion thereof distant from said smooth forming roll for picking up the web from said inner endless fabric means and directing the web along a path of travel to press and dryer sections of the paper machine, said pick-up means including a pair of rolls and a pick-up felt, said inner endless fabric means being guided around one of said pair of rolls while said pick-up felt is guided around the other of said pair of rolls and pressed thereby toward said inner endless fabric means for engaging the web thereon, said other of said pair of rolls including a suction means for detaching the web from said inner endless fabric means and transferring the web to said pick-up felt for travel therewith beyond said other of said pair of rolls, a pair of press rolls forming part of a press section of the paper machine and defining between themselves a first press nip, said pick-up felt travelling between said pair of press rolls for transporting the web to said first press nip, said pair of press rolls including an upper press roll around which said pick-up felt is guided and the other of said pair of press rolls being a lower press roll and having a recessed surface, the press section including a lower felt engaging said lower press roll and travelling through said first press nip together with the web and said pick-up felt, said upper press roll including a suction means causing the web to travel with said pick-up felt around said upper press roll while said lower felt travels by itself beyond said first press nip, the dryer section of the machine including a Yankee cylinder defining with said upper press roll a second press nip through which the pick-up felt travels for transferring the web in closed conduction up to said second press nip.

4,055,462

APPARATUS FOR FORMING A FIBER ORIENTED HANDSHEET

Thomas C. Hsu, and John L. Miller, both of Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,625
Int. Cl.[2] D21F *13/02*
U.S. Cl. 162—382 **5 Claims**



1. An apparatus for forming a paper handsheet having a substantially unidirectional fiber orientation from a dilute slurry of paper pulp comprising

a pulp reservoir vessel constructed substantially symmetrical about a vertical drain axis,

a sink vessel disposed beneath said pulp vessel,

a horizontal forming wire separating said pulp vessel from said sink vessel,

a valved conduit drain from said sink, the improvement comprising:

substantially rectangular thin liner means of substantially uniform section transverse of said drain axis inserted within said pulp vessel, and

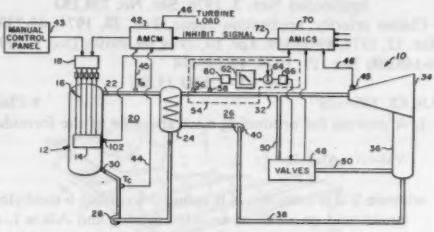
first and second flow guide surfaces within said liner means forming a two-dimensional convergent nozzle therein having a planar throat area positioned in the proximity of said forming wire and asymmetrical of said drain axis, the plane of said throat disposed at an acute angle relative to said drain axis.

4,055,463

AUTOMATIC MOTION INHIBIT SYSTEM FOR A NUCLEAR POWER GENERATING SYSTEM

Jose Marcelo Torres, Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 18, 1975, Ser. No. 605,707
Int. Cl.[2] G21C 7/00
U.S. Cl. 176—24 R 10 Claims



1. A nuclear power generating system comprising:

coolant vapor generating apparatus including a nuclear reactor having a nuclear core and a plurality of control elements movable within said core for controlling the power output thereof;

a turbine for receiving coolant vapor produced by said vapor generating apparatus;

coolant circuitry for connecting said vapor generating apparatus and said turbine including means for delivering vapor to said turbine;

coolant vapor relief means in said coolant circuitry operable to cause at least some of the coolant vapor to be diverted from said turbine;

means for generating a power demand signal proportional to the quantity of coolant vapor required by said turbine;

means responsive to said reactor for generating a reactor power output signal commensurate with the reactor power output;

automatic motion control means responsive to power demand and the power output of said nuclear core for automatically controlling the motion of said control elements within said nuclear core to adjust the power output of said nuclear core to be equal to turbine load;

means responsive to said coolant vapor relief means for producing a total capacity signal proportional to the power level corresponding to the total capacity of said coolant vapor relief means to divert coolant vapor from said turbine;

means responsive to said power demand signal and said total capacity-signal for producing a signal proportional to the sum of said power demand signal and said total capacity signal, said resultant signal being the reactor power level setpoint signal;

means responsive to said power output signal and said reactor power level setpoint signal for comparing said power output signal and said reactor power level setpoint signal and for generating a signal indicative of the condition where the final reactor power level setpoint exceeds the reactor power, said signal being called the setpoint-greater-than-power signal;

means responsive to said power demand signal for comparing the power level demand with a predetermined power level demand threshold and for generating a signal indicative of the condition where the power level demand is less than a predetermined power level demand threshold, said signal being called the demand-less-than-threshold signal;

means responsive to at least said demand-less-than threshold signal and said setpoint-greater-than-power signal for generating a motion inhibit signal at least when both said demand-less-than-threshold signal and said setpoint-greater-than-power signal are present; and

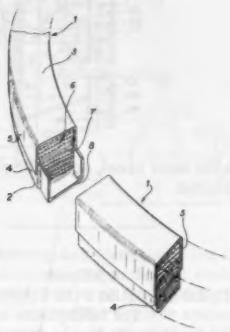
means responsive to said motion inhibit signal for inhibiting operation of said automatic control means.

4,055,464

HEAT-INSULATING STRUCTURE

Guy Lemercier, Le Puy Sainte Reparade, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed July 22, 1976, Ser. No. 707,556
Claims priority, application France, July 24, 1975, 75.23152
Int. Cl.[2] G21C 15/10
U.S. Cl. 176—87 7 Claims



1. A heat-insulating structure for use in the wall of a containment vessel for a nuclear reactor forming a heat source comprising a plurality of elements, two sectional members of substantial length for each of said elements, said elements being disposed in juxtaposed relation in line two angular end portions for each of said two sectional members engaged one inside the other, parallel faces for said elements having a small clearance space between said parallel faces, at least one of said angular portions of two successive ones of said elements being shaped for interengagement of said elements with play along their length, and a flexible packing of metallic material between said sectional members whereby said sectional members work in pairs along the length and in the direction of engagement of said members.

4,055,465

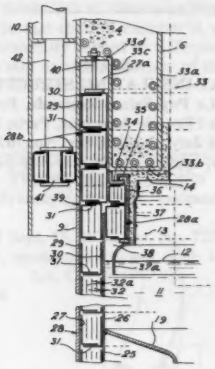
DEVICE FOR THERMAL INSULATION OF A VESSEL WALL

Guy Lemercier, Le Puy Sainte Reparade, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed July 22, 1976, Ser. No. 707,557
Claims priority, application France, July 24, 1975, 75.23153
Int. Cl.[2] G21C 9/00
U.S. Cl. 176—87 7 Claims

1. A device for thermal insulation of a vessel and especially of the internal wall of the primary vessel of a liquid metal cooled fast reactor, within an annular space delimited between the primary vessel and an inner vessel which is enclosed by said primary vessel and has a free extremity, wherein said device comprises a plurality of superposed resilient heat-insulating elements, said elements being such as to extend circumferentially around the common axis of the two vessels, the primary vessel and the inner vessel having a common vertical axis, the primary vessel being suspended from a horizontal vault roof which delimits with the level of liquid metal within the inner vessel a space filled with an insulating layer of inert gas charged with liquid metal aerosols, the free end of the

inner vessel being protected from the insulating gas layer by a cylindrical baffle-plate mounted beneath the vault roof and



coaxial with the inner vessel, said baffle-plate being immersed in the liquid metal.

4,055,466

CULTURE MEDIUM FOR TISSUE CULTURE TECHNIQUES

Harry L. Torney; Helen T. Torney, both of Indianapolis, Ind., and Dale E. Bordt, Des Moines, Iowa, assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 377,838, July 9, 1973, Pat. No. 3,887,430, which is a continuation of Ser. No. 229,219, Feb. 24, 1972, abandoned, which is a continuation of Ser. No. 58,203, July 24, 1970, abandoned. This application May 30, 1975, Ser. No. 582,462

The portion of the term of this patent subsequent to June 3, 1992, has been disclaimed.

Int. Cl.[2] C12B *3/00*

U.S. Cl. 195—1.7 **3 Claims**

1. In a serum-free, protein-free, culture medium composition for the propagation of animal tissue cells in tissue culture, the composition comprising a buffered aqueous solution of sugars, amino acids, mineral salts and vitamins, the improvement wherein the culture medium further comprises a growth-enhancing amount of a strongly basic anion-exchange resin obtained by reacting trimethylamine with a halomethylated polymer prepared by reacting chloromethyl methyl ether in the presence of a zinc chloride catalyst with beads of a copolymer of about 90 percent of styrene and 2 percent of divinylbenzene and a water-soluble lipid source selected from the group consisting of polysorbate 60 and polysorbate 80 in an amount of from about 0.001 to about 0.100 parts by volume of lipid source per 100 parts by volume of medium.

4,055,467

ENZYMATIC DISPERSION OF BIOLOGICAL SLIMES

Ronald J. Christensen, Westmont, and George J. Zivtins, Schaumburg, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 20, 1976, Ser. No. 752,226

Int. Cl.[2] C12B *1/00*; D21F *1/66*

U.S. Cl. 195—2 **2 Claims**

1. A method for preventing slimes from being deposited on solid surfaces in contact with industrial process waters which comprises treating these waters with at least 3 ppm of the enzyme, Rhozyme HP-150, a pentosanase-hexosanase.

4,055,468

PROCESSES FOR PRODUCING PHYSIOLOGICALLY ACTIVE PEPTIDE AND ITS N-ACYL DERIVATIVES

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Takaaki Aoyagi, Fujisawa; Akira Takamatsu, Yokohama; Taiji Inui, Chigasaki; Hiroshi Tone, Fujisawa, and Hajime Morishima, Tokyo, all of Japan, assignors to Sanraku-Ocean Co., Ltd., Tokyo, Japan

Division of Ser. No. 551,459, Feb. 20, 1975, abandoned. This application Nov. 3, 1976, Ser. No. 738,193

Claims priority, application Japan, Feb. 28, 1974, 49-23953; Mar. 12, 1974, 49-28849; Apr. 10, 1974, 49-40696; Dec. 17, 1974, 49-145208; Dec. 19, 1974, 49-146474

Int. Cl.[2] C12D *13/06*

U.S. Cl. 195—29 **6 Claims**

1. A process for producing a tetrapeptide of the formula:

Val—X—Ala—X,

wherein Val is L-valine, X is amino-3-hydroxy-6-methylheptanoic acid or a salt or an ester thereof and Ala is L-alanine, and the carboxyl group of the X between Val and Ala being bound to the amino group of Ala to form a peptide bond and the amino group of the X between Val and Ala being bound to the carboxyl group of Val to form a peptide bond, the amino group of the other X being bound to the carboxyl group of Ala to form a peptide bond, and the carboxyl group of the other X being free or esterified or bound to a cation to form a salt

which comprises decomposing an N-acyl peptide of the general formula:

R—Val—Val—X—Ala—X,

wherein Val, Ala and X are the same as previously defined, and R is an acyl radical having carbon atoms of 2 to 8 or an acyl radical partially substituted by one or more hydroxyl groups or halogen atoms or a C-terminal of an esterified carboxyl group, and the amino group of the Val adjacent to X being bound to the carboxyl group of the other Val to form a peptide bond and the carboxyl group of the R being bound to the amino group of the Val to form an amide bond,

specifically to carboxylic acid, L-valine and and Val—X—Ala—X by contacting said N-acyl peptide with an enzyme produced by a microorganism.

4,055,469

PURIFICATION OF MICROBIAL ENZYME EXTRACTS USING SYNTHETIC POLYELECTROLYTES

Roy Eugene Snoke, Webster, and Gerald Wayne Klein, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 10, 1976, Ser. No. 749,647

Int. Cl.[2] C07G *7/028*

U.S. Cl. 195—66 R **14 Claims**

1. A method for purifying a microbial enzyme extract, comprising the step of precipitating nucleic acids and unwanted protein by adding to the extract an effective amount of a water-soluble, cationic polymer comprised of a cationic monomer having the formula

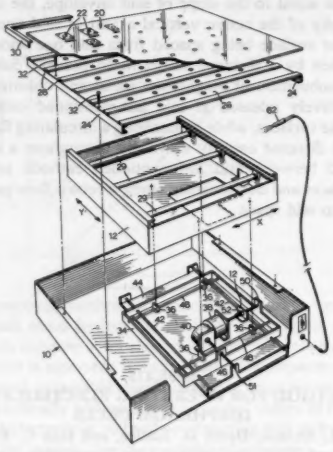
wherein R_1 is a hydrogen atom or a lower alkyl group, and R_2 is a nitrogen containing group capable of carrying a positive electrical charge when the polymer is dissolved in an aqueous solution having a pH value not greater than about the pKa of the polymer.

4,055,470

DEVICE FOR EXAMINING BIOLOGICAL SPECIMENS

Edward Thomas Sheaff, and Norman Alexander Hinton, both of Toronto, Canada, assignors to K-Vet Limited, Cambridge, Canada

Filed June 9, 1976, Ser. No. 694,077
Claims priority, application Canada, June 10, 1975, 229154
Int. Cl.[2] C12K 1/00
U.S. Cl. 195—127 4 Claims



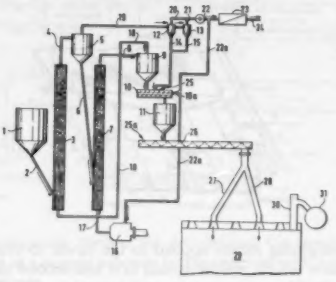
1. In a device for reading and recording the sensitivity of a series of specimens wherein a test plate is inoculated with a series of specimen organisms at predetermined spaced sites thereon, incubated, and the clone at each site examined to determine whether the organism is sensitive or resistant to the test antibiotic or positive or negative with respect to a test biochemical having a frame, a mount for a plurality of test plates arranged in a predetermined pattern, mounting means for mounting said mount in said frame for movement along an X axis and Y axis, control means for moving said mount in said mounting means along the X axis and the Y axis, a viewing plate on said frame above said mount, a viewing system for each plate on said mount terminating in a viewing opening at said viewing plate for viewing the specimens one at a time on its respective plate in said mount, said control means being adapted to move said mount in said mounting means as aforesaid with preset sequential incremental movements to move each of the series of specimens and each plate into the field of its respective viewing system in turn for viewing through said lens system the improvement which comprises a positive signal terminal on said plate adjacent each viewing opening of said viewing means, a negative signal terminal on said plate adjacent each viewing opening of said viewing means, manually operable means for actuating said positive and said negative signal terminals, means for transmitting signals from said positive signal terminal and from said negative signal terminal to signal recording means, and means on said viewing plate for indicating when a signal from said positive or said negative signal terminals has been transmitted to said recording means by said means for transmitting signals.

4,055,471

METHOD OF RESTRICTING THE FORMATION OF DUST WHEN FEEDING COAL INTO COKE OVENS

Kurt-Günther Beck; Wolfgang Rohde; Diethard Habermehl, and Werner Siebert, all of Essen, Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed Jan. 6, 1976, Ser. No. 646,751
Claims priority, application Germany, Jan. 9, 1975, 2500606
Int. Cl.[2] C10B 57/04
U.S. Cl. 201—20 8 Claims



1. A method of inhibiting dust formation while feeding coal into a coking chamber, comprising preheating coal, and subsequently contacting said coal with an aqueous solution of 30–70% by weight of waste sulfite liquor in amounts of about 0.5 to 1.0 parts by weight of said solution per 1000 parts by weight of said coal.

4,055,472

METHOD OF PREPARING NICKEL ALLOY PARTS FOR PLATING

Ivan Gene Freshcorn, Kenton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Sept. 15, 1976, Ser. No. 723,319
Int. Cl.[2] C25D 5/40
U.S. Cl. 204—32 R 7 Claims

1. A method of preparing a nickel alloy part for plating, including the steps of immersing the part in an electrolyte bath, connecting the part as the anode in an electric circuit which when energized causes current flow to take place from said part outward into the bath, energizing said circuit and establishing and maintaining said current flow for a period of time sufficient to etch the part surface, etched metal being oxidized during the period of current flow, discontinuing current flow and after the current flow has been discontinued allowing the part to remain soaking in the same said electrolyte bath for a period of time sufficient to dissolve formed metallic oxides, removing the part from said bath, and while said part is substantially free of metallic oxides depositing on the surface thereof a plating base material penetrating and interlocking with etched surface portions of said part.

4,055,473

PROCESS AND APPARATUS FOR SOLAR DISTILLATION

Harold R. Hay, 2424 Wilshire Blvd., Los Angeles, Calif. 90057

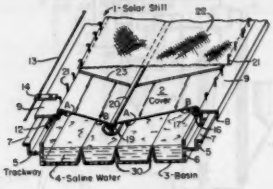
Continuation-in-part of Ser. No. 120,183, March 2, 1971, Pat. No. 3,846,251. This application Nov. 4, 1974, Ser. No. 520,852
Int. Cl.[2] B01D 1/00
U.S. Cl. 202—234 15 Claims

1. A distillation apparatus comprising a solar still having in combination at least one distilland-retaining component within at least one rigid side wall, a cover capable of transmitting solar radiation to convert distilland to vapor of a liquid condensed to distillate removed by a collector, and the improvement which comprises a cover-fastening means made movable

in a trackway forming part of said side wall of said distilland-retaining component having:

a. a first element with a first portion into which the cover is fastened by a spline of material softer than that from which said first element is formed and having a portion of the spline interposed between the cover and said first portion;

b. a second portion of the first element in the form of an interlocking means which engages a corresponding interlocking means on a second element of said cover-fastening means which second element comprises a portion of a rigid trackway attached to said rigid side wall;



c. a weighting means applied to the cover to create cover tension which maintains said first and second elements in interlocking engagement and improves the effect of a vapor sealing means interposed between said first and second elements in their interlocking engagement; and

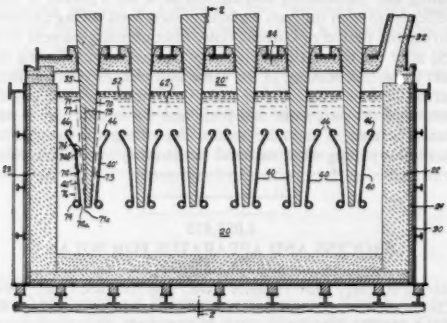
d. a cover-moving means attached to the first element and operating in a trackway forming a portion of a sidewall also integrated with a rain- and a condensate-collecting trough, said cover-moving means and trackway permitting the cover to be moved in its operating shape while maintaining said first and second elements in a substantially interlocked engagement, from a first location over the distilland-retaining component to a second position exposing said distilland-retaining component.

4,055,474

PROCEDURES AND APPARATUS FOR ELECTROLYTIC PRODUCTION OF METALS

Olivo Giuseppe Sivilotti, Kingston, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Nov. 10, 1975, Ser. No. 630,459
Int. Cl.[2] C25C *3/04*
U.S. Cl. 204—70 **8 Claims**



1. Procedure for electrolysis of magnesium chloride to produce free magnesium metal, including the step of

a. maintaining, in an enclosed cell chamber, a molten electrolytic bath containing magnesium chloride for electrolysis, free magnesium metal being lighter than said bath; and

b. passing direct electric current through the bath between at least one anode and at least one cathode in contact with the bath for depositing free magnesium metal at said one cathode for upward flow along said cathode and evolving chlorine gas at said one anode for upward travel through said bath within an envelope diverging upwardly at a substantially constant slope;

wherein the improvement comprises:

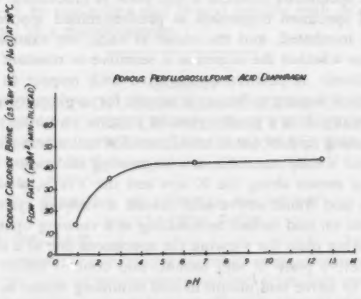
c. said current-passing step comprising passing current through said bath between a major surface of said one anode that slants upwardly toward said one cathode throughout the active vertical extent of said one anode major surface with a slope greater than the slope of said envelope, and a major surface of said one cathode that faces and slants upwardly away from said one anode major surface throughout the active vertical extent of said one cathode major surface with a slope not more than about equal to the slope of said envelope, the lower extremity of the active vertical extent of said one cathode major surface being spaced from said one anode major surface by a distance sufficient to prevent contact and recombination of magnesium metal and chlorine gas respectively released at said last-mentioned cathode and anode surfaces, while maintaining a circulating flow of the bath directed entirely upwardly throughout a space defined between said last-mentioned cathode and anode surfaces and downwardly along a return flow path external to said space.

4,055,475

METHOD FOR OPERATING ELECTROLYTIC DIAPHRAGM CELLS

Ronald L. Dotson; David D. Justice, and Han C. Kuo, all of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 24, 1976, Ser. No. 660,959
Int. Cl.[2] C25B *1/26*; C25C *1/16*
U.S. Cl. 204—98 **11 Claims**



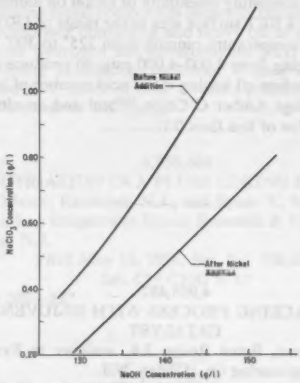
1. In a method for controlling the flow properties of a porous diaphragm in an electrolytic cell for producing chlorine gas and a caustic liquor by the electrolysis of an alkali metal chloride solution, said electrolytic cell comprised of an anode compartment containing said alkali metal chloride solution and a cathode compartment containing said caustic liquor, said anode compartment separated from said cathode compartment by said porous diaphragm consisting essentially of a perfluorosulfonic acid ion exchange resin having an acid form and an alkali metal salt form, said method being characterized by the improvement which comprises maintaining the pH of said alkali metal chloride solution in said anode compartment at from about 3.0 to about 5.0.

4,055,476

METHOD FOR LOWERING CHLORATE CONTENT OF ALKALI METAL HYDROXIDES

Leo L. Benezra, Mentor; David W. Hill; Arnold Riihimaki, both of Painesville, and Shan-Pu Tsai, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Jan. 21, 1977, Ser. No. 760,910
Int. Cl.[2] C25B 1/16, 1/26
U.S. Cl. 204—98 6 Claims



1. An improved method of minimizing chlorate contamination of alkali metal hydroxides made by electrolysis of alkali metal halide solution in an electrolytic cell wherein the anode compartment is separated from the cathode compartment by a porous, liquid permeable diaphragm, said improvement comprising periodically adding dissolved nickel values to the brine feed of said electrolytic cell and precipitating said nickel values on and in the porous, liquid permeable diaphragm.

4,055,477

ELECTROLYZING BRINE USING AN ANODE COATED WITH AN INTERMETALLIC COMPOUND

Harlan B. Johnson, Rittman, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 515,938, Oct. 18, 1974, Pat. No. 4,007,107. This application Oct. 22, 1976, Ser. No. 734,849
Int. Cl.[2] C25B 11/06, 11/10, 1/20
U.S. Cl. 204—98 15 Claims

1. In a method of electrolyzing brine wherein brine is fed to an electrolytic cell having an anode and a cathode, an electrical current passes from the anode to the cathode, and chlorine is evolved at the anode, the improvement wherein said anode comprises:

an electroconductive substrate; and

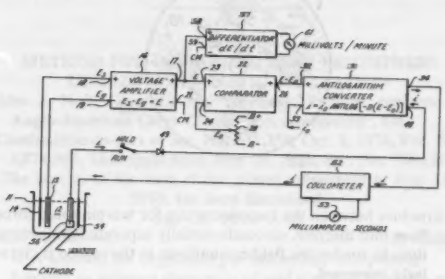
an electroconductive layer comprising an intermetallic compound of a platinum group metal and a transition metal chosen from the group consisting of RuTi, RuV, Ru_2Zr, NbRu, RuTa, Mo_3Ru_3, W_3Ru_2, $RuCr_2$, Sn_2Ru, Rh_3Ti, Rh_3V, Rh_3Zr, Rh_3Nb, Rh_3Ta, $RhCr_3$, Rh_3Sn, Rh_3Pb_2, OsTi, OsV, OsZr, Nb_3Os_2, $Mo_{19.5}Os_{10.5}$, Ta_3Os, WOs_2, Cr_2Oe, $TiIr_3$, VIr_3, $ZrIr_2$, Ir_3Nb, Mo_3Ir, $TaIr_3$, $HfIrNi$, Cr_3Ir, Mn_3Ir, $IrSn_2$, Pt_3Ti, Pt_3V, Pt_3Zr, Pt_3Nb, Pt_3Mo, Pt_4Ta, Pt_3Fe, $PtCr_2$, Pt_2Sn_3, $PbPt_3$, $PbPt_6$, $PbPt_2$, $Ti_9Re_{1.1}Si_2$, Re_3V, Re_2Zr, NbRe, MoRe, TaRe, WRe, Re_3Fe_2, $Re_6Co_{3.7}Si_{1.3}$, CrRe, Mn_3Re_2, $TiPd_3$, Pd_3V, Pd_3Zr, PdTa, $FePd_3$, Pd_3Mn_2, $PdSn_3Pd_3Pb$, and mixtures thereof, on said substrate.

4,055,478

COULOMETRIC TITRATOR

Homer M. Wilson, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Dec. 22, 1975, Ser. No. 643,064
Int. Cl.[2] G01N 27/44
U.S. Cl. 204—195 T 6 Claims



1. A coulometric titrator for determining the amount of a specific ion in a sample solution by the reaction with a reactive ion comprising:

a. a cell for containing said sample solution and including electrodes for immersion in said solution, said electrodes including a reference electrode providing a first signal voltage and a specific ion sensing electrode providing a second signal voltage representing the logarithm of the concentration of the specific ion in said sample solution;

b. differential input amplifier means having as inputs said first and second signal voltages from said reference and specific ion sensing electrodes and said differential input amplifier having as its output an error signal voltage representing the difference between said first and second signal voltages;

c. reference means providing a reference voltage for the specific ion in the solution indicative of a particular rate of change of the second signal voltage while said rate of change of the second signal voltage is constant;

d. comparator means receiving as inputs said error signal voltage and said reference voltage and providing as its output a sensor signal voltage representing the difference between said error signal and reference voltages;

e. antilogarithm converter means receiving said sensor signal voltage and having an output signal that is proportional to the antilogarithm of said sensor signal voltage; and

f. reactive ion source means in the sample solution receiving said output signal and associated with a current source providing an unidirectional current flow between an anode and a cathode immersed in the sample solution and said reactive ion source means is either the anode or the cathode with the other being inert and with the quantum rate of reactive ion introduction into the sample solution being proportional to said output signal, whereby said second signal voltage changes at a constant rate with time and said reactive ion addition changes in a logarithmically decreasing amount with time in the sample solution until the stoichiometric endpoint is approached.

4,055,479

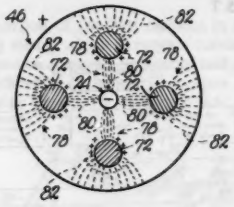
FLUID TREATER HAVING ELECTRIC FIELD WARPING MEANS

Arthur S. King, 8021 Cherokee Lane, Leawood, Kans. 66206

Filed Aug. 10, 1976, Ser. No. 713,250
Int. Cl.[2] B03C 5/02
U.S. Cl. 204—302 10 Claims

1. In a device usable for treating fluids to induce precipitation of suspended solid material wherein the fluid is passed through the annular region between a tubular outer electrode and an inner electrode of substantially smaller diameter coaxi-

ally housed within the outer electrode, said electrodes being electrically insulated from one another to preclude electrical current flow across said region but to establish an electric field having radial lines of force spanning said region, the improvement comprising:



structure between the two electrodes for warping said force lines into discrete, circumferentially separated concentrations to render the field nonuniform as the region is circularly traversed.

2. In a device as claimed in claim 1, wherein said warping structure includes at least one elongated conductor extending parallel to said inner electrode within said region.

4,055,480

MULTI-PHASE SEPARATION METHODS AND APPARATUS

Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 460,558, April 12, 1974, Pat. No. 3,941,679, and Ser. No. 561,168, March 24, 1975, which is a continuation-in-part of Ser. No. 423,577, Jan. 14, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,888

Int. Cl.² C10G *1/04*

U.S. Cl. 208—11 LE **29 Claims**

1. A method of resolving a mixture or composite containing both soluble and insoluble hydrocarbonaceous materials and insoluble mineral material into separate phases two of which respectively contain said insoluble hydrocarbonaceous material and said insoluble mineral material and the third of which contains said soluble hydrocarbonaceous material, said method comprising the steps of: introducing said mixture or composite into a body of a liquid which contains 1,2-difluoroethane or a fluorochlorocarbon solvent for said soluble hydrocarbonaceous material and which has a specific gravity intermediate the specific gravities of said insoluble materials and is not miscible therewith, whereby said soluble hydrocarbonaceous material will dissolve in said liquid to form said third phase, one of said insoluble material will migrate toward the top of the body of liquid to form one of said two other phases, and the other of said insoluble materials will migrate toward the bottom of said body of liquid to form the other of said two phases; separately removing the insoluble material phases and said third phase from said body of liquid; and stripping the solvent from said third phase to isolate said soluble hydrocarbonaceous material.

4,055,481

TWO-STAGE PROCESS FOR MANUFACTURE OF WHITE OILS

Louis E. Kidwell, Jr., Shreveport, La., assignor to Pennzoil Company, Shreveport, La.

Filed July 23, 1976, Ser. No. 707,949

Int. Cl.² C10G *23/02*

U.S. Cl. 208—89 **10 Claims**

1. A method for the production of pharmaceutical grade white oils having sufficient purity to pass the Hot Acid Carbonizable Substances Test and the Ultraviolet Absorbance Test, which comprises the steps of subjecting a lubricating oil feedstock having a viscosity ranging from about 60 to about 600 SUS at 37.8° C., to a first stage hydrogenation in the presence of a first stage sulfur-resistant catalyst having a metal, metal oxide or metal sulfide from Group VI-B and a metal, metal oxide or metal sulfide from Group VIII of the Periodic System of the Elements, at a temperature in the range of about 300° to about 400° C. and a pressure of from 800–4,000 psig, to produce a first stage intermediate product having a viscosity reduced from the viscosity of the starting feedstock, and then subjecting the first stage intermediate product to a second stage hydrogenation in the presence of a second stage hydrogenation catalyst consisting essentially of nickel on alumina, said catalyst having a BET surface area in the range of 130 m^2/g to 190 m^2/g, at a temperature ranging from 225° to 300° C., and a pressure ranging from 2,000–4,000 psig, to produce a colorless, odorless, white oil having a hot acid number of less than 16 on the Hellige Amber C Color Wheel and an ultraviolet absorbance value of less than 0.1.

4,055,482

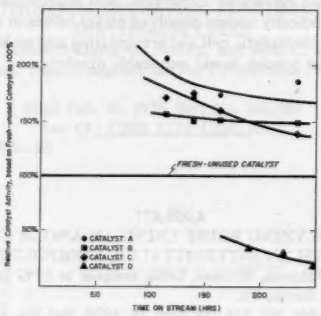
HYDROCRACKING PROCESS WITH REJUVENATED CATALYST

Harry E. Robson, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 107,224, Jan. 18, 1971, abandoned. This application July 1, 1975, Ser. No. 592,120

Int. Cl.² C10G *13/02*; B01J *29/12*

U.S. Cl. 208—111 **10 Claims**



1. A hydrocracking process which comprises contacting a hydrocarbon feedstock in the presence of hydrogen at hydrocracking conditions of temperature and pressure with a rejuvenated catalyst comprising a synthetic faujasite zeolite and a hydrogenation component, said rejuvenated catalyst (1) having previously become at least partially deactivated after being used in a hydrocracking process including periodic regeneration by contact with an oxygen-containing gas at a temperature within the range of 700° to 1100° F., and (2) having been rejuvenated to at least substantially its original fresh activity by an aqueous treating process restricted to a pH less than about 7.0, said catalyst being rejuvenated by (a) treating said partially deactivated catalyst with an aqueous solution containing ions selected from the group consisting of hydrogen ions, hydrogen precursor ions and mixtures thereof so that the alkali metal content of the zeolite component is less than the amount of alkali metal originally present in said catalyst prior to said treatment with aqueous solution; (b) washing said catalyst subsequent to said contacting; and (c) calcining said washed catalyst at a temperature within the range of about 50° to 1000° F.

4,055,483

HYDROREFINING OF HEAVY OIL WITH HYDROGEN AND ALUMINUM ALKYL COMPOUND

Joseph K. Mertzweiller, and Roby Bearden, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Aug. 2, 1976, Ser. No. 710,800
Int. Cl.[2] C10G 23/02
U.S. Cl. 208—213 12 Claims

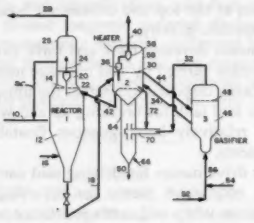
1. A process for hydrorefining a heavy hydrocarbonaceous oil containing metal compounds naturally occurring in said oil, which comprises, contacting said heavy oil, in a hydrorefining zone, with hydrogen and an aluminum alkyl compound, at hydrorefining conditions, including a temperature ranging from about 500° to about 1500° F. and a pressure ranging from about 500 to about 3000 psig.

4,055,484

ELUTRIATION IN A FLUID COKING PROCESS

Don E. Blaser, Randolph, N.J., and Byron V. Molstedt, Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed May 14, 1976, Ser. No. 686,634
Int. Cl.[2] C10G 9/32
U.S. Cl. 208—127 6 Claims



1. In an integrated coking and gasification process which comprises the steps of:

a. reacting a carbonaceous material having a Conradson carbon content of at least 5 weight percent in a coking zone containing a bed of fluidized solids maintained under fluid coking conditions to form coke, said coke depositing on said fluidized solids;

b. introducing a portion of said solids with the coke deposition thereon into a heating vessel comprising an elongated lower portion and an upper enlarged portion containing a fluidized bed of solids maintained at a greater temperature than the temperature of said coking zone, to heat said portion of solids;

c. recycling a first portion of heated solids from said heating vessel to said coking zone;

d. introducing a second portion of heated solids from said heating vessel to a fluidized bed gasification zone;

e. reacting said second portion of heated solids in said gasification zone with steam and an oxygen-containing gas to produce a hydrogen-containing gaseous stream,

f. removing said hydrogen-containing gaseous stream including entrained solids from said gasification zone;

g. adding a portion of solids to said hydrogen-containing gas of step (f),

the improvement which comprises:

h. introducing into said lower elongated portion the solids-containing gaseous stream resulting from step (g), said gaseous stream being introduced as a relatively high velocity gaseous stream through a conduit having an outlet of smaller internal diameter than the internal diameter of said elongated lower portion;

i. reducing the velocity of said gaseous stream by upwardly flowing said stream from said outlet to said upper portion of said heating vessel, whereby the larger particles of the solids are selectively removed by gravitational forces from said gaseous stream and form a dense bed below said outlet of said gaseous stream in said lower heating vessel portion;

j. maintaining the bed in said lower heater portion fluidized by passage of a fluidizing gas therethrough, and

k. continuously re-entraining at least a portion of the solids from said lower heater bed into said gaseous stream.

4,055,485

METHOD FOR IMPROVING CLAY BRIGHTNESS UTILIZING MAGNETIC SEPARATION

Alan J. Nott, Crantock near Newquay, England, assignor to Anglo-American Clays Corporation, Sandersville, Ga.

Continuation-in-part of Ser. No. 513,154, Oct. 8, 1974, Pat. No. 3,974,067. This application July 28, 1976, Ser. No. 708,850
The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.
Int. Cl.[2] B03B 1/00
U.S. Cl. 209—3 10 Claims

1. A method for brightening a kaolin clay comprising:

forming an aqueous dispersion of said clay and blunging and conditioning said dispersion to dissipate at least 10 hp/hrs of energy per ton of solids, at least said conditioning step being conducted in the presence of a fatty acid collector agent;

subjecting the resultant blunged and conditioned slurry to a froth flotation treatment to remove titaniferrous impurities; and

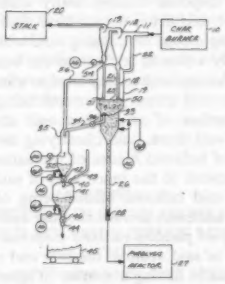
subjecting the product from said froth flotation treatment to a wet magnetic separation to further increase the brightness of said clay by removal of discoloring contaminants in addition to said titaniferrous impurities, by passing said product through a slurry-pervious ferromagnetic matrix positioned in a high intensity magnetic field, the retention time in said field being at least 15 seconds, and the said field being maintained at an average field intensity of from 7 to 22 kg.

4,055,486

METHOD AND APPARATUS FOR HANDLING SOLID FLUIDIZED PARTICLES

Charles K. Choi, Claremont, and Joseph P. Tassoney, Diamond Bar, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 603,871, Aug. 11, 1975, abandoned. This application July 30, 1976, Ser. No. 710,109
Int. Cl.[2] B07B 9/02
U.S. Cl. 209—11 35 Claims



1. Apparatus for handling solid fluidized particles, the apparatus comprising:

a source of fluid and entrained particles including fines;

a particle storage vessel having an outlet near its bottom;

a particle separator having

an entrance lying above the storage vessel and connected to the source,

a fluid exit,

a particle exit connected to the storage vessel, and

means for separating particles from fluid received at the entrance such that the fluid with a first percentage of the fines entrained therein flows to the fluid exit and the particles minus the first percentage of the fines pass through the particle exit to the storage vessel;

means for fluidizing the particles in the storage vessel to a particular level above the outlet;

means for removing fluidized particles with a second percentage of the fines entrained therein from the storage vessel at a point between the particular level and the outlet;

a receiver connected to the outlet of the storage vessel to receive fluidized particles minus the first and second percentages of the fines flow from the outlet of the storage vessel; and

means for changing at least one of the percentages of the fines.

4,055,487

DRUM-TYPE SAND CLASSIFIER

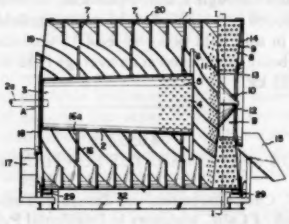
Takuo Moori, Miyazaki, Japan, assignor to Akae Kikai Kogyo Co., Ltd.

Continuation-in-part of Ser. No. 592,973, July 3, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 759,958

Claims priority, application Japan, July 9, 1974, 49-78829; Nov. 2, 1974, 49-126858; Apr. 21, 1975, 50-50118

Int. Cl.[2] B03B 5/56

U.S. Cl. 209—44 **6 Claims**



1. A wet-type sand classifier comprising:

a. a rotary drum which has a front outlet at its front end and a rear outlet at its rear end,

b. a feeding means for feeding muddy water containing sand into said drum, said feeding means being enclosed by said drum and disposed concentrically within said drum, and attached to said drum for rotation with said drum,

c. a classifying means for causing sand which is contained in said muddy water to settle onto the bottom of said drum and transferring said settled sand towards the rear end of said drum, said classifying means being disposed on the interior surface of said drum and covering the entire length of said drum, said classifying means comprising a plurality of helicoid blades of the same pitch which are fixedly secured to the inner wall of said drum at regular intervals, said helicoid blades being of a height which gradually increases toward the rear end of said drum, and a plurality of paddles radially disposed around the inner periphery of said drum at the rear end of said drum, each of said paddles having a number of apertures on the entire surface thereof for separating the water from the sand before the sand is discharged from the classifier, and

d. a discharging means for expelling said transferred sand from the rear outlet of said drum, said discharging means being disposed at the rear end of said drum and attached to said drum for rotation with said drum, whereby substantially water-free classified sand of a desired size range is produced by the rotation of said drum with minimum wear of the classifier due to friction from the sand.

4,055,488

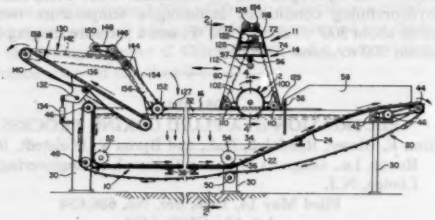
WOOD CLEANING AND SEPARATING APPARATUS

Joseph J. Siri, and John P. Knapp, both of Portland, Oreg., assignors to Siri Systems, Inc., Portland, Oreg.

Filed May 28, 1976, Ser. No. 690,849

Int. Cl.[2] B03B 5/28

U.S. Cl. 209—173 **13 Claims**



1. In a separator,

a tank open at the top and containing liquid of a predetermined specific gravity,

carriage means movable back and forth along said tank,

agitator means carried by said carriage means, said agitator means being disposed to contact the upper portion of said liquid in said tank for breaking up and washing a floating pile of relatively heterogeneous floatable and sinkable components,

reversible drive means for driving said carriage means,

resistance responsive means for reversing said reversible drive means when said carriage means encounters a predetermined minimum resistance to movement along said tank, and

conveyor means for removing the floatable components from said tank.

4,055,489

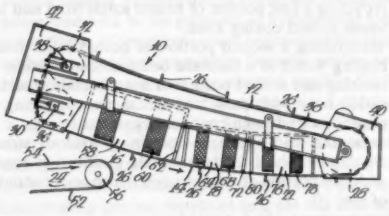
MAGNETIC SEPARATOR FOR SOLID WASTE

Warren G. Soley, Greenfield, Wis., assignor to Magnetics International, Inc., Maple Heights, Ohio

Filed July 21, 1975, Ser. No. 597,406

Int. Cl.[2] B03C 1/16

U.S. Cl. 209—223 R **23 Claims**



1. A magnetic separator for extracting magnetic material from a mixture of magnetic and non-magnetic material comprising:

a non-magnetic material discharge zone;

a magnetic material discharge zone spaced from said non-magnetic discharge zone;

a plurality of magnets generating a series of longitudinally adjacent rows of magnetic fields, each row in said series being generated by at least one magnet, each of said mag-

nets having a core towards which said magnetic material is attracted;

means for supplying said mixture at a position within the first row of magnetic fields in said series whereby said magnetic material within said mixture is attracted by the magnetic fields of said first row;

at least one of said magnets having a core disposed along a longitudinal axis spanning substantially between said supply means and said magnetic material discharge zone, the remainder of said magnets having cores spaced laterally of said longitudinal axis, each of said cores defining a path of a width equal to the width of the core, none of the paths generated by at least one row of magnets in said series passing through a core in each row of said series; and

means extending between longitudinally adjacent rows of magnetic fields for transporting said magnetic material from one row of magnetic fields in said series to the next row of magnetic fields in said series, said transporting means being situated intermediate said magnetic material and said magnets so that said magnetic material is attracted to and held in contact with said transporting means, said transporting means also transporting said magnetic material from the last magnetic field in said series to said magnetic material discharge zone, said magnetic fields being of such strength and said transporting means being so disposed relative to said magnetic fields whereby said magnetic material is agitatedly transported longitudinally and laterally from said first row of magnetic fields to said magnetic material discharge zone so that said non-magnetic material entrapped in said magnetic material is discarded in said non-magnetic material discharge zone and said magnetic material is released in said magnetic material discharge zone free of non-magnetic material.

4,055,490

ACTIVATED SLUDGE PROCESS

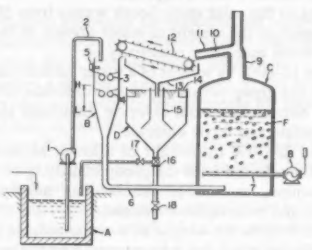
Tsuneo Hasegawa, and Seitaro Hasegawa, both of Kyoto, Japan, assignors to Seisuikogyo Co., Ltd., Osaka, Japan

Filed June 17, 1976, Ser. No. 697,209

Claims priority, application Japan, June 24, 1976, 51-76856; June 24, 1976, 51-76857

Int. Cl.² C02C *5/10*

U.S. Cl. 210—17 **7 Claims**



1. An activated sludge process for treating waste water, said process employing an aeration tank having at its upper end a narrowed discharge conduit of smaller transverse cross-sectional area than the transverse cross-sectional area of the main body of said aeration tank, which comprises the steps of: feeding waste water into said aeration tank and flowing an oxygen-containing gas upwardly through said waste water in said aeration tank and thence through said discharge conduit thereby aerating and agitating said waste water in the presence of a multitude of small spongy pieces, said spongy pieces being in a free flowing state suspended in the waste water in said aeration tank and having activated sludge adhering to the surfaces thereof, said spongy pieces retaining said activated sludge thereon in a condition effective to cause said waste water to be purified by said activated sludge under aerated conditions, the flow of said gas into said discharge conduit generating an air lift effect for moving waste water and spongy pieces from the top of said aeration tank upwardly into said discharge conduit;

intermittently or continuously discharging from said aeration tank a portion of the contents of said aeration tank comprising a mixture of said spongy pieces and treated waste water, said portion being discharged through said discharge conduit by the air lift effect;

feeding the spongy pieces discharged from said aeration tank into a head tank having pressing rolls located therein and containing the waste water that is to be fed into said aeration tank, and pressing the spngy pieces thereby removing a part of the sludge that is adhered thereto and is present in the interior thereof and then discontinuing the pressing whereby to restore the spongy pieces to a state in which they are capable of supporting treatment of waste water under aerated activated sludge conditions without proliferation of anaerobic bacteria in the interiors thereof; and then returning the thus-treated spongy pieces into said aeration tank.

4,055,491

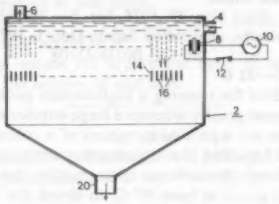
APPARATUS AND METHOD FOR REMOVING FINE PARTICLES FROM A LIQUID MEDIUM BY ULTRASONIC WAVES

Asher Porath-Furedi, 10 Kubovy St., Jerusalem, Israel

Filed June 2, 1976, Ser. No. 691,982

Int. Cl.² B01D *35/20*; B03D *3/06*; C02B *1/80*

U.S. Cl. 210—19 **10 Claims**



4. A method of removing microscopic particles from a liquid medium comprising the steps of: propagating ultrasonic waves in the horizontal direction at a frequency of over one megacycle per second through the liquid medium to cause the flocculation of the particles at spaced points in the direction of propagation of the ultrasonic waves; discontinuing the propagation of the ultrasonic waves to permit the settling by gravity of the flocculated particles through baffle means disposed below the level of propagation of the ultrasonic waves which baffle means provides a high resistance to the horizontal propagation therethrough of the ultrasonic waves and a low resistance to the vertical settling therethrough by gravity of the flocculated particles; periodically repeating propagating and discontinuing the propagation of the ultrasonic waves to periodically flocculate and then settle the particles; and removing the settled flocculated particles.

4,055,492

PROCESS FOR THE EXTRACTION OF HEAVY METALS FROM DILUTED AQUEOUS HEAVY METAL SALT SOLUTIONS

Wolfgang Rupilius, and Werner Stein, both of Dusseldorf, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Germany

Filed June 29, 1976, Ser. No. 700,865

Claims priority, application Germany, July 7, 1975, 2530244

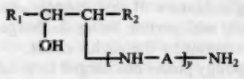
Int. Cl.² B01D *11/04*

U.S. Cl. 210—21 **6 Claims**

1. A process for the extraction of heavy metal ions capable

of forming complexes with amines from dilute aqueous heavy metal salt solutions cnsisting essentially of the steps of

a. dissolving from 2% to 15% by weight, based on the weight of the dilute aqueous heavy metal salt solution, of at least one vicinal aminoalkanol of the formula



wherein R_1 and R_2 are unbranched alkyl having from 1 to 17 carbon atoms and the sum of the carbon atoms in R_1 and R_2 is from 7 to 18, A is a member selected from the group consisting of alkylene having from 2 to 6 carbon atoms and methylalkylene having from 3 to 7 carbon atoms, and *y* is an integer from 1 to 2, with the proviso that the vicinal substituents are distributed statistically, in a dilute aqueous heavy metal salt solution in the absence of organic solvents, at a temperature below the turbidity temperature of said vicinal aminoalkanols;

b. heating the solution to a temperature of at least 10° C above said turbidity temperature whereby two liquid phases are formed, and

c. separating the organic phase containing the heavy metal ion.

4,055,493

METHOD FOR OPENING A HIGH-DENSITY PACKED COLUMN IN LIQUID CHROMATOGRAPHY

Shigeru Sawanishi; Masahiko Ozaki, and Kikuji Katagawa, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Nov. 29, 1976, Ser. No. 745,920
Claims priority, application Japan, Dec. 1, 1975, 50-143679
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—31 C **10 Claims**

1. A method for opening a high-density packed column in liquid chromatography wherein a large number of components in a solution are separated by means of a column in which a swollen gel is packed at a high density, characterized by passing air through the column while heating the column to a temperature above at least 40° C. to shrink the volume of the packed column, and then opening the column.

4,055,494

THICKENING DEVICE AND METHOD

Robert C. Emmett, Jr., Salt Lake City, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Feb. 14, 1977, Ser. No. 768,315
Int. Cl.[2] C02B *1/20;* **C02C** *5/02;* **B01D** *21/01*
U.S. Cl. 210—49 **21 Claims**

1. A machine for continuously separating suspended solids from a feed stream liquor by gravity settling comprising:

a. a liquid-holding tank for containing a body of liquid in generally quiescent condition;

b. an upstanding tubular column mounted within said liquid-holding tank;

c. means mounted at the upper end of said tubular column to convey a stream of feed liquor into the interior of said tubular column;

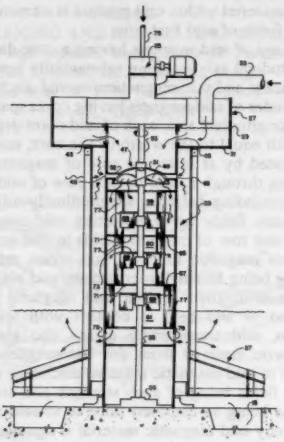
d. flocculating-mixing compartments formed within said tubular column, one below another, to sequentially receive the feed liquor;

e. mixing means mounted within each of said flocculating-mixing compartments to blend the liquid therein;

f. reagent introduction means mounted within each of said flocculating-mixing compartments to disperse a chemical flocculating reagent into the compartment for enhancing the flocculation of suspended solids within the feed liquor;

g. discharge means in liquid-flow communication with the lowermost one of said flocculating-mixing compartments and with the interior of said liquid-holding tank for discharging the flocculated feed liquor into a pulp blanket stratum at the bottom of said liquid-holding tank;

h. raking means including rake arms mounted within said



liquid-holding tank to urge solids settled in the pulp blanket stratum to underflow discharge; and

i. overflow means mounted on said liquid-holding tank to remove clarified supernatant therefrom.

4,055,495

FORMULATION AND APPLICATION OF ALKALINE ZINC CHLORIDE COMPOSITIONS AND DETACKIFICATION OF PAINT SPRAY BOOTH WASTES

Robert K. Gabel, and Paul L. Seitz, both of Houston, Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 534,505, Dec. 19, 1974, Pat. No. 3,990,986.
This application May 24, 1976, Ser. No. 689,701
Int. Cl.[2] C02C *5/02*
U.S. Cl. 210—52 **6 Claims**

1. A process for the clarification and detackification on paint spray booth wastes which comprises:

A. Adding to the paint spray booth wastes from 50 to 1,000 ppm based on the weight of water present in the waste a composition consisting essentially of

a. From 10–60% by weight of a water soluble metallic salt from the group consisting of zinc chloride, zinc sulfate, zinc nitrate, aluminum chloride, aluminum sulfate, ferric sulfate and ferric chloride:

b. From 20–70% by weight of a lower aliphatic amino alcohol selected from the group consisting of monoethanolamine, monoisopropanolamine, monopropanolamine, and monoisobutanolamine;

c. From 0–20% by weight of a water soluble polyether polyamine which has been prepared by the steps which comprise:

1. Reacting a polyalkylene oxide, said alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide and butylene oxide with a lower difunctional epoxide selected from the group consisting of epichlorohydrin, epibromohydrin and epiiodohydrin in a mole ratio of hydroxyl groups present on said polyalkylene oxide to lower difunctional epoxide of from 0.5:1.0 to 1.0:0.5, said polyalkylene oxide further characterized as having a molecular weight of from 100 to 1,000 whereby a capped polyalkylene oxide is formed;

2. Reacting the capped polyalkylene oxide of step 1 with a lower aliphatic amine having from 2–8 carbon atoms and two or more amino groups in a mole ratio of from 1:5 to 1:1 based on the number of amino

groups present on the amine compound and the number of halogens on the capped polyalkylene oxide; and then,

3. Recovering the polyether polyamine;

d. From 20–60% by weight water.

B. Mixing the composition of Step A with the paint spray booth waste;

C. Allowing the composition to interact with the waste whereby the paint particles contained therein are coated by the hydroxide of the metallic salt and detackified;

D. Recovering the metallic hydroxide coated detackified paint particles whereby the aqueous paint spray booth waste is clarified.

4,055,496

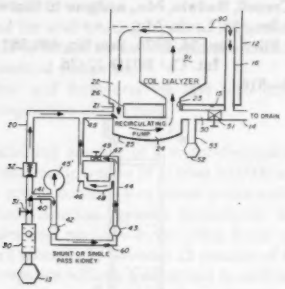
DIALYSIS APPARATUS

Richard A. Friedrich, Brighton, and Robert L. MacNeill, Newburyport, both of Mass., assignors to National Medical Care, Inc., Boston, Mass.

Continuation of Ser. No. 462,411, April 19, 1974, abandoned. This application Feb. 18, 1975, Ser. No. 550,169

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—87 **15 Claims**



1. A dialysis apparatus for selective use with single pass or single pass-recirculating artificial kidney dialyzers to provide for dialysate flow, said apparatus comprising,

a housing, a dialysate canister open to the atmosphere and carrying a dialysate overflow means for limiting a level of dialysate in said canister,

a dialysate flow conduit having a first inlet for connection to a source of fresh dialysate and an outlet opening for passing dialysate to said canister,

a mounting opening in said canister for detachably mechanically mounting an artificial kidney dialyzer therein,

recirculating pump means having a conduit interconnecting one portion of said canister with said mounting opening for permitting dialysate recirculation therethrough,

a first shunt dialysate conduit connected to said flow conduit at a first point intermediate said canister opening and said first inlet,

said shunt dialysate conduit terminating at a first shunt connector,

a second shunt connector spaced from said first shunt connector,

a second shunt dialysis conduit leading from said second shunt connector to a second point for passing dialysate to said canister,

said second shunt dialysate conduit having a negative pressure pump and means for adjusting the value of negative pressure produced by said pump.

4,055,497

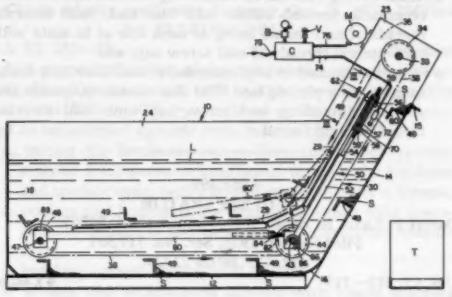
HOLD-DOWN MECHANISM FOR SCRAPER CONVEYOR AND SETTLING TANK

John L. Creps, Rudolph; Stephen N. McEwen, Bowling Green, and Arthur D. Myerholtz, Portage, all of Ohio, assignors to Henry Manufacturing Co., Inc., Bowling Green, Ohio

Filed Oct. 12, 1976, Ser. No. 731,307

Int. Cl.[2] B01D *21/18*

U.S. Cl. 210—91 **18 Claims**



1. A hold-down mechanism for a drag-out conveyor along the bottom and the ramp side of the settling tank, comprising:

A. control means extending along the ramp side of said tank and being connected for slight pivotal movement at its upper end near the upper end of said ramp side and being pivotally connected at its lower end to the bend in said conveyor near the bottom of said ramp side for supporting said conveyor at said bend,

B. guide means in said tank engageable with the lower end of said control means, and

C. resilient means for urging the bend of said conveyor toward the bottom of said tank.

4,055,498

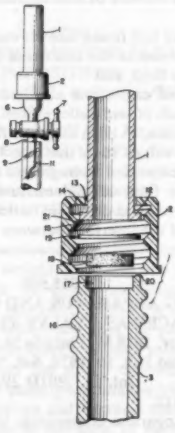
SELECTIVE FILTRATION APPARATUS

Desmond Arpad Radnoti, 670 Alta Vista, Sierra Madre, Calif. 91024

Filed Aug. 6, 1975, Ser. No. 602,406

Int. Cl.[2] B01D *35/00*

U.S. Cl. 210—94 **11 Claims**



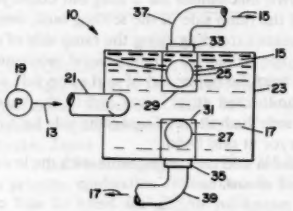
1. A filter unit comprising:

a reservoir;

a hollow cylindrical screw cap being open at one end and having a circular opening smaller in diameter than the

inside diameter of said screw cap in the other end, said screw cap also having internal threads formed therein;
a flange integrally formed on one end of said reservoir, the diameter of said flange being larger than said diameter of said circular opening in said screw cap but smaller than the inside diameter of said screw cap, said reservoir protruding through said circular opening in said screw cap, said flange preventing said reservoir from passing completely through said circular opening in said screw cap;
a funnel having external threads along one end thereof and a receptacle formed inside said one end, said external threads of said funnel being of such size as to mate with said internal threads of said screw cap; and
a filter disc housed in said receptacle, said filter unit being assembled by placing said filter disc in said receptacle and securely threading said serew cap onto said external threads of said funnel.

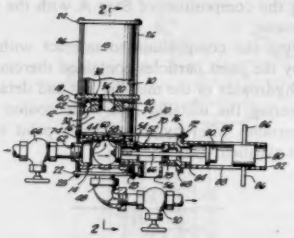
4,055,499
FLUID SEPARATOR
Darryl E. Laxo, 10 Zanco Way, Novato, Calif. 94947
Filed Sept. 1, 1976, Ser. No. 719,551
Int. Cl.[2] B01D *21/26*
U.S. Cl. 210—119 **4 Claims**



1. A fluid separator comprising:
a. a closed container;
b. means for injecting a mixture of fluids having differing densities into said container so that said mixture is stratified;
c. a top outlet valve at the top of said container to connect the interior of said container to a first exhaust pipe;
d. a bottom outlet valve at the bottom of said container to connect the interior of said container to a second exhaust pipe;
e. a plurality of ball floats, one for each of said outlet valves, ballasted to sink in the less dense fluid and to float in the more dense fluid; and
f. a plurality of cages, one attached interiorly of said container to each of said outlet valves, each containing one of said ball floats, to keep said ball floats aligned with their respective valves such that the less dense fluid of said mixture is exhausted through said top outlet valve and the more dense fluid of said mixture is simultaneously exhausted through said bottom outlet valve depending upon the level of the interface between the fluids.

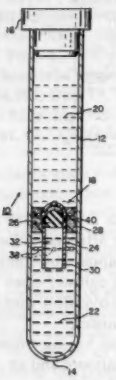
4,055,500
FILTERING APPARATUS AND QUICK-OPENING BACKWASH VALVE THEREFOR
Leland L. Parker, 1018 W. Ontario St., Corona, Calif. 91720
Filed Feb. 10, 1976, Ser. No. 656,939
Int. Cl.[2] B01D *29/38*
U.S. Cl. 210—412 **25 Claims**

1. Filtering apparatus comprising, in combination:
a. a filter having an inlet for a pressurized fluid to be filtered, and an outlet for the filtered fluid;
b. control valves respectively for said filter inlet and said filter outlet;
c. means providing a reversed flow backwash connection through the filter from a source of pressurized filtered fluid to a point of discharge, when said filter inlet and outlet control valves are closed; and
d. a backwash poppet valve in said reversed flow connection



normally urged by fluid presure to a closed position and having actuator means operable to effect a quick opening of the valve, whereby to produce an explosive surge in the backwash flow to dislodge accumulated filtered media in the filter.

4,055,501
FLUID COLLECTION DEVICE WITH PHASE PARTITIONING MEANS
William D. Cornell, Ballwin, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.
Filed Jan. 16, 1976, Ser. No. 649,881
Int. Cl.[2] B01D *21/26*
U.S. Cl. 210—516 **16 Claims**



1. A blood collection device for receiving a sample of blood adapted to be centrifugally separated into a lighter phase and a heavier cellular phase comprising a closed container tube for receiving the sample of blood, means closing one end of said tube, a needle-pierceable stopper closing the other end of said tube, and a phase partitioning device within said closed tube including first and second relatively movable members having axially spaced facing surfaces and a combined average specific gravity intermediate that of the lighter phase and that of the heavier phase and with said first member having a specific gravity greater than that of said second member, and a flowable sealant disposed between said facing surfaces in direct contact with one of said members before centrifugation, said sealant having a specific gravity substantially equal to said combined average specific gravity, both of said members having a width substantially less than the inner diameter of said tube to allow fluid to readily flow by said partitioning device during separation of the phases, one of said members having a

plurality of circumferentially spaced, radially outwardly extending stabilizing means thereon for maintaining said partitioning device in a substantially predetermined orientation in said tube during centrifugation of the collection device, said partitioning means being movable to a position in said tube adjacent the interface of the phases and said sealant being squeezeable generally radially outwardly from between said facing surfaces and into contact with the inner wall of said tube in response to the relative movement of said spaced surfaces of said members toward each other due to centrifugal forces during centrifugation of the collection device to provide, with said first and second members, a partition sealing the heavier phase from the lighter phase.

4,055,502

METHOD AND COMPOSITION FOR ACIDIZING SUBTERRANEAN FORMATIONS

Billy L. Swanson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 24, 1975, Ser. No. 643,984
Int. Cl.[2] E21B *43/27*
U.S. Cl. 252—8.55 C **39 Claims**

1. A method for acid treating a porous subterranean formation susceptible of attack by an acid and penetrated by a well bore, which method comprises:

injecting into said formation via said well bore a gelled acidic composition comprising

water;

a water-thickening amount of a water-dispersible polymer having a molecular weight of at least 500,000 and selected from the group consisting of linear polyacrylamides and polymethacrylamides; partially hydrolyzed linear polyacrylamides and partially hydrolyzed linear polymethacrylamides wherein up to about 25 percent of the carboxamide groups are initially hydrolyzed to carboxyl groups; crosslinked polyacrylamides and crosslinked polymethacrylamides; partially hydrolyzed crosslinked polyacrylamides and partially hydrolyzed crosslinked polyacrylamides wherein up to about 25 percent of the carboxamide groups are initially hydrolyzed to carboxyl groups; linear copolymers of acrylamide or methacrylamide with another ethylenically unsaturated monomer copolymerizable therewith, sufficient acrylamide or methacrylamide being present in the monomer mixture to impart said water-dispersible properties to the resulting copolymer when it is mixed with water, and mixtures thereof;

an amount of a water-dispersible flavotannin gelling agent which is sufficient to cause gelation of an aqueous dispersion of the components of said composition;

an amount of a non-oxidizing acid which is sufficient to and capable of reacting with a significant amount of the acid-soluble components of said formation;

said polymer, said flavotannin gelling agent, and said acid, in the amounts used, being sufficiently compatible with each other in an aqueous dispersion thereof to permit said gelation and thus form a said composition having sufficient stability to degeneration by the heat of said formation to permit good penetation of said composition and in said formation; and

maintaining said composition in said formation in contact therewith for a period of time usually sufficient for the acid in said composition to react significantly with the acid-soluble components of said formation and stimulate the production of fluids therefrom.

4,055,503

LUBRICATING POWDER AND METHOD OF PRODUCING SAME AND RELATIVELY SLIDEABLE COMPONENTS

Wolfgang Anselment, Stuttgart, and Walter Gritschmeier, Waiblingen, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Continuation-in-part of Ser. No. 512,169, Oct. 4, 1974, abandoned. This application Apr. 13, 1976, Ser. No. 676,407
Claims priority, application Germany, Oct. 11, 1973, 2351044
Int. Cl.[2] C10M *7/04, 7/16*
U.S. Cl. 252—12 **5 Claims**

1. A process of making a lubricant powder consisting essentially of a mixture of about 80% to 60% by weight of graphite and about 20% to 40% by weight of a mixture of a hardener and an unhardened epoxide resin comprising:

a. mixing the hardener with molten unhardened epoxide resin at a temperature insufficient to react the hardener and epoxide resin, until a homogeneous mixture is formed;

b. cooling said homogeneous mixture to form a solid homogeneous mixture of said hardener and unhardened epoxide resin;

c. breaking up said cooled solid mixture;

d. mixing said broken solid mixture with coarse graphite particles; and

e. grinding said graphite-containing mixture into particles of a maximum size of 200 micrometers.

4,055,504

STABILIZER IN A HIGH VOLTAGE INSULATION ON A POLYOLEFIN BASE

Heinz Heumann, Rheydt; Manfred Saure, Kassel; Heinz Wagner, Fuldatal, and Johann Wartusch, Vellmar, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main and Aeg-Telefunken Kabelwerke Aktiengesellschaft, Rheydt, both of, Germany

Filed May 12, 1976, Ser. No. 685,539
Claims priority, application Germany, May 17, 1975, 2522200
Int. Cl.[2] H01B *3/30, 3/24*
U.S. Cl. 252—63.2 **12 Claims**

1. A high voltage insulation polyolefin base having a stabilizing amount of a wetting agent as a stabilizer to improve the voltage stability of the polyolefin base, the wetting agent being a sulfonamide-ethylene oxide adduct having a perfluoro-alkyl group.

4,055,505

ACTIVATED PERCOMPOUND BLEACHING COMPOSITIONS

Frederick W. Gray, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 487,889, July 12, 1974, Pat. No. 3,982,892. This application Dec. 15, 1975, Ser. No. 641,013
The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.
Int. Cl.[2] C11D *7/54, 7/56*
U.S. Cl. 252—102 **22 Claims**

1. An activated percompound bleaching composition consisting essentially of, by weight, 5 to 75% of a bleaching percompound selected from the group consisting of inorganic percompounds and urea peroxide, 0.5 to 15% of an activator for such percompounds which activates the percompound to promote bleaching in an aqueous bleaching solution, said activator being selected from the group consisting of 2-[di(2-hydroxy-C_1–C_3 alkyl) amino]-4,6-dihalo-s-triazine, 2,4-di-C_1–C_4 alkoxy-6-halo-s-triazine and mixtures thereof, 5 to 75% of molecular sieve zeolite in the form of particles having a mean particle diameter in the range of 0.5 to about 12 microns which is selected from the group consisting of Type A, X, Y, L. mordenite and erionite zeolites, said zeolite containing from 1.5 to 36% by weight of water and having a cation selected from the group consisting of sodium, potassium, lithium, am-

monium and hydrogen, 0 to 40% of a water-soluble synthetic organic detergent, 0 to 50% of a water-soluble alkali metal inorganic or organic builder salt and 0 to 50% of sodium sulfate or sodium chloride, said composition containing 0.1 to 1.5 parts of activator per part of percompound and 0.2 to 10 parts of molecular sieve zeolite per part of bleaching percompound and having a pH in the range of 8 to 12 in water.

4,055,506

NOVEL FRAGRANCE COMPOSITIONS AND PERFUMED ARTICLES CONTAINING ALPHA-SUBSTITUTED ACETALDEHYDE

Alan Owen Pittet, Atlantic Highlands; Erich Manfred Klaiber, Neptune; Manfred Hugo Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y., and Joaquin Vinals, Red Bank, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

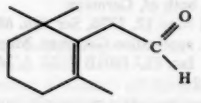
Division of Ser. No. 598,805, July 24, 1975, Pat. No. 4,026,824, which is a continuation-in-part of Ser. No. 507,412, Sept. 19, 1974, Pat. No. 3,940,499. This application Nov. 11, 1976, Ser. No. 740,949

The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.

Int. Cl.[2] C11D *9/44*

U.S. Cl. 252—132 **3 Claims**

1. A process for altering or enhancing the organoleptic properties of a soap which comprises adding thereto an aroma altering, modifying or enhancing amount of a composition comprising 2,6,6-trimethyl-1-cyclohexen-1-ylacetaldehyde having the structure:



4,055,507

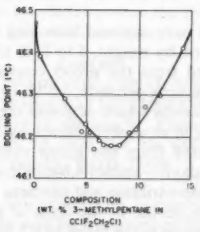
METHYLPENTANE/$CCLF_2CH_2CL$ AZEOTROPIC MIXTURES

Kavsy D. Dastur, Yorklyn, and Robert A. Gorski, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 31, 1975, Ser. No. 645,698

Int. Cl.[2] C11D *7/30, 7/24;* C23G *5/02*

U.S. Cl. 252—162 **3 Claims**



1. An azeotropic composition consisting essentially of about from 4 to 10 weight percent 3-methylpentane and about from 96 to 90 weight percent $CClF_2CH_2Cl$.

4,055,508

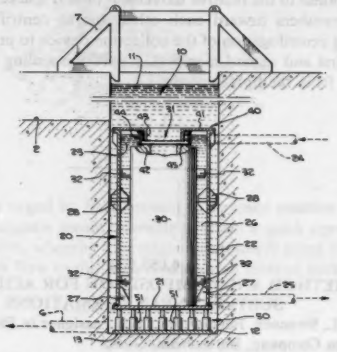
CASK HANDLING METHOD AND APPARATUS

Alfred H. Yoli, New City, N.Y., and Igbal Husain, Danbury, Conn., assignors to Automation Industries, Inc., Los Angeles, Calif.

Filed Aug. 6, 1976, Ser. No. 712,176

Int. Cl.[2] G21C *9/32*

U.S. Cl. 252—301.1 W **15 Claims**



1. Apparatus for preventing radioactive contaminated water in a well from contacting the outside of a cask to be positioned in the well to receive radioactive material being transported through the well and into the cask through an opening in the cask, comprising:

tank means positioned in the well and having an upper opening for receiving the cask lowered therethrough to be placed within said tank means;

seal means between the tank means and cask for preventing water in the well from flowing into the tank means about the cask and permitting water in the well to flow into the cask through said cask opening whereby radioactive wastes can be moved through the contaminated water in the well into the cask without contaminating the outside of the cask.

4,055,509

METHOD FOR INCREASING THE WATER DISPERSIBILITY OF ALPHA ALUMINA MONOHYDRATE

Dean R. Weimer, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 291,501, Sept. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 140,945, May 6, 1971, abandoned. This application June 7, 1976, Ser. No. 693,562

Int. Cl.[2] B01F *3/18*

U.S. Cl. 252—363.5 **9 Claims**

1. A method for increasing the water dispersibility of alpha-alumina monohydrate containing up to about 86 weight percent Al_2O_3, said method comprising, admixing by dry blending an amount equal to from about 0.1 to about 50 weight percent, based on the weight of the alpha alumina monohydrate, of at least one salt compound selected from the group consisting of salts having the general formula MX, wherein M is a polyvalent metal cation constituent selected from the group consisting of Sc^{+3}, Y^{+3}, Nd^{+3}, Sn^{+3}, Eu^{+3}, Gd^{+3}, Er^{+3}, Tm^{+3}, Yb^{+3}, Lu^{+3}, Ti^{+3}, Zr^{+4}, Th^{+3}, Cr^{+3}, U^{+4}, Mn^{+3}, Fe^{+3}, Co^{+3}, Ru^{+3}, Pd^{+2}, Pt^{+2}, Au^{+3}, Al^{+3}, Ga^{+3}, In^{+3}, Sn^{+2}, Sn^{+4}, Bi^{+3}, and wherein X is an anion constituent derived from a monovalent acid and is selected from the group consisting of Cl^-, NO_3^-, I^-, ClO_3, ClO_4^-, Br^-, MnO_4^-, and phosphorous dichloride, phosphorus trichloride, phosphorous pentachloride, phosphorus tribromide, phosphorous pentabromide, and antimony pentachloride with said alpha alumina monohydrate.

4,055,510
METHOD FOR MANUFACTURING OF SPHERICAL CELLULOSE PARTICLES

Jan Peska; Jiri Stamberg, both of Prague, and Zdenko Blace, Neratovice, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed May 21, 1975; Ser. No. 579,716

Claims priority, application Czechoslovakia, May 30, 1974, 3858/74

Int. Cl.² B01J *37/00*; B01D *3/00*

U.S. Cl. 252—426 **14 Claims**

1. A method of producing spherical cellulose particles, which consists of the sequence of steps of providing a dispersion of viscose droplets in a water-immiscible liquid, heating such dispersion at a temperature of at least 30° to 100° C. with continuous agitation under stationary hydrodynamic conditions for a time sufficient to partially regenerate the cellulose in the viscose and to thereby, and solely as a result of said heating, solidify the viscose droplets into shape-stable particles, and thereafter completing the regeneration of the cellulose in such solidified viscose droplets by treatment with an added acid.

4,055,511
CATALYST FOR PREPARATION OF 4-CYANOTHIAZOLE

Glenn R. Elion, Avenel, and Arthur E. Klink, Lebanon, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 15, 1976, Ser. No. 666,713

Int. Cl.² B01J *23/88, 27/10*

U.S. Cl. 252—435 **3 Claims**

1. A catalyst composition prepared by the process of adding to a solution of chromium chloride and cobalt molybdate a compound selected from the group consisting of potassium hydroxide, ferric chloride, ammonium orthophosphate, telluric acid, potassium sulfate and vanadyl sulfate wherein the molar ratio of molybdenum:cobalt is from 1.20:1.00 to 1.05:1.00; the molar ratio of the chromium chloride:cobalt molybdate is 0.6:1 to 1.4:1 and the molar ratio of a compound selected from said group to cobalt molybdate is 0.01:1 to 0.08:1 for potassium hydroxide; 0.001:1 to 0.01:1 for ferric chloride; 0.001:1 to 0.04:1 for ammonium orthophosphate; 0.01:1 to 0.05:1 for telluric acid; 0.01:1 to 0.08:1 for potassium sulfate; and 0.01:1 to 0.08:1 for vanadyl sulfate, and drying and firing for about 12 hours at 450° C.

4,055,512
CATALYST FOR PRODUCING CYCLOOLEFIN AND METHOD FOR MAKING THE SAME

Yoichi Kageyama; Yozo Kato, both of Yokohama, and Hisao Kosugi, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

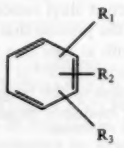
Continuation-in-part of Ser. No. 575,073, May 6, 1975, abandoned. This application July 1, 1976, Ser. No. 701,496

Claims priority, application Japan, May 9, 1974, 49-51596; Feb. 17, 1975, 50-19594

Int. Cl.² B01J *23/02, 23/34, 23/46, 23/74*

U.S. Cl. 252—441 **11 Claims**

1. A catalyst for producing a cyclomonoolefin by hydrogenating an aromatic hydrocarbon of the formula:



wherein R_1, R_2 and R_3 are the same or different and each represents hydrogen or a C_1 – C_3 alkyl, at 100° – 200° C under a hydrogen pressure of 5 – 100 atm in an aqueous medium having a pH of 2 – 7, prepared by a process comprising:

1. immersing a carrier into a first aqueous solution containing at least one salt whose cationic component is selected from the group consisting of sodium, potassium, magnesium, calcium, barium, zinc, manganese and iron thereby obtaining a treated carrier containing said salt and separating said salt impregnated carrier from said first aqueous solution;
2. supporting at least one ruthenium or rhodium compound on said treated carrier and reducing said compound such that ruthenium or rhodium is reduced to the metallic state; and
3. immersing the carrier supporting at least one metal selected from the group consisting of rhodium and ruthenium into a second aqueous solution containing at least one salt whose cationic component is selected from the group consisting of sodium, potassium, magnesium, calcium, barium, zinc, manganese and iron thereby obtaining a ruthenium or rhodium supported carrier which is impregnated with said salts of steps (1) and (3) and separating the resultant catalyst from said second aqueous solution.

4,055,513
PEROVSKITE CATALYSTS AND PROCESS FOR THEIR PREPARATION

Kenneth S. Wheelock, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Apr. 13, 1976, Ser. No. 676,511

Int. Cl.² B01J *21/04, 23/02, 23/10, 23/78*

U.S. Cl. 252—462 **22 Claims**

1. In a supported perovskite catalyst for hydrocarbon conversion and hydrocarbon treating processes which comprises a perovskite comprising at least one transition metal, the improvement which comprises: a support comprising a metal oxide and a spinel on the surface of said metal oxide, said spinel being selected from the group consisting of normal spinel and inverse spinel, said normal spinel having an empirical formula MY_2O_4 wherein M and Y in said normal spinel formula are cations of different metals and wherein one of said cations of said normal spinel formula is the metal of said metal oxide, said inverse spinel having an empirical formula $Y(XY)O_4$ wherein Y and X in said inverse spinel formula are cations of different metals, and wherein one of said cations of said inverse spinel formula is the metal of said metal oxide, said supported catalyst having a surface area of at least 65 m^2/g.

4,055,514
CATALYST FOR PREPARATION OF 4-CYANOTHIAZOLE

Glenn R. Elion, Avenel, and Arthur E. Klink, Lebanon, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 15, 1976, Ser. No. 666,714

Int. Cl.² B01J *23/88*

U.S. Cl. 252—470 **2 Claims**

1. An ammoxidation catalyst composition prepared by the process of treating cobalt molybdate with a solution of potassium hydroxide, drying and firing for about 4 hours at 450° C, wherein the molybdenum cobalt molar ratio is from 1.20:1.00 to 1.05:1.00 and potassium cobalt molar ratio from 0.001:1.0 to 0.1:1.0.

4,055,515
DEVELOPER FOR PRINTING PLATES

John Nicholas Kirch, Blue Ash, Ohio, assignor to Borden, Inc., Columbus, Ohio

Filed Dec. 31, 1975, Ser. No. 645,704

Int. Cl.² C11D *7/50*; G03C *5/24*; C11D *7/32*

U.S. Cl. 252—542 **9 Claims**

1. Developer composition for developing an exposed photosensitive coating on a substrate to remove therefrom non-image areas comprising, on weight basis, 50 to 85% water; 10 to 25% relatively non-volatile solvent selected from C_1 to C_6 alkyl alcohols, Cellosolve, Cellosolve acetate, butyl Cello-

solve, methyl Cellosolve, and mixtures thereof; 0.1 to 5% of a detergent selected from the group consisting of nonionic, anionic and cationic detergents of the mild variety; and 5 to 15% of a pyrrolidone lubricant.

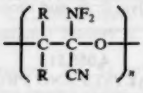
4,055,516

POLY(CYANODIFLUOROAMINO ETHERS), THEIR PREPARATION AND UTILIZATION

Leon Hunter, Walnut Creek, and Walter L. Petty, Moraga, both of Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 24, 1971, Ser. No. 127,805
Int. Cl.[2] C08G *65/32*
U.S. Cl. 260—2 A **13 Claims**

1. A polymer containing high energy groups and improved thermal stability which comprises a polyether having repeating units of



wherein each R is a lower alkyl radial or hydrogen and *n* is an integer between 10 and 60.

12. A cured polymer having high energy groups and improved thermal stability which is suitable as a solid propellant binder which comprises the reaction product of the polymer of claim **1** with an organic polyisocyanate.

4,055,517

PROCESS FOR PRODUCING WATER-SOLUBLE ORGANIC MACROMOLECULES, AND THE WATER-SOLUBLE ORGANIC MACROMOLECULES OBTAINED

Wolfgang Daimer, Graz, Austria, assignor to Vianova Kunstharz A.G., Vienna, Austria

Filed Aug. 26, 1975, Ser. No. 607,910
Claims priority, application Austria, Aug. 27, 1974, 6924/74
Int. Cl.[2] C08G *59/14*
U.S. Cl. 260—2 EP **10 Claims**

1. Process for producing water-soluble organic macromolecules comprising reaction at a temperature of from about 0° to 150° C. a water-insoluble reaction product selected from the group consisting of

a. a polyepoxide and a secondary amine;

b. a polymer containing ester groups and a low volatile N-tertiary substituted alkanol amine; the reaction product carrying at least one mole of tertiary substituted basic nitrogen atoms in 1,000 g of macromolecular substance and having a molecular weight from about 400 to 20,000, with a substance which will split off oxygen and continuing the reaction until the macromolecular substance is water soluble.

4,055,518

VINYL CHLORIDE RESIN COMPOSITION

Haruaki Kakitani, and Satoru Sugino, both of Yokkaichi, Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed Oct. 28, 1975, Ser. No. 626,461
Claims priority, application Japan, Oct. 28, 1974, 49-124088
Int. Cl.[2] C08J *9/00*
U.S. Cl. 260—2.5 AM **14 Claims**

1. A crosslinkable vinyl chloride resin composition comprising; a vinyl chloride copolymer containing from 90 to 99.5 wt.% of vinyl chloride and from 10 to 0.5 wt.% of a hydroxyl group containing comonomer, from 1 to 10 parts by weight of a polyisocyanate compound per 100 weight parts of said vinyl chloride copolymer, and a stabilizer composed principally of salt of a metal of Group II*a* in the Periodic Table.

4,055,519

SIMULTANEOUSLY FOAMED RESIN AND MAGNESIUM OXYCHLORIDE CEMENT

Henry Clark Thompson, Saratoga, Calif., assignor to Henry Clark Thompson, Saratoga, Calif.

Continuation-in-part of Ser. No. 397,833, Sept. 17, 1973, Pat. No. 3,951,885, which is a continuation-in-part of Ser. No. 194,557, Nov. 1, 1971, Pat. No. 3,778,304, which is a continuation-in-part of Ser. No. 811,616, March 28, 1969, abandoned, which is a continuation-in-part of Ser. No. 589,808, Oct. 27, 1966, abandoned. This application Apr. 19, 1976, Ser. No. 678,168
The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.
Int. Cl.[2] C08G *18/14*; C08K *3/22*; C08J *9/00*
U.S. Cl. 260—2.5 AK **8 Claims**

1. In a method of preparing a fireproof material, the steps of mixing

a. between 1 and 9 parts by weight on a dry basis of

1. aqueous magnesium chloride having a specific gravity between 21.5 and 22.5° Baume,
2. between 5 and 6.5 pounds magnesium oxide per gallon of aqueous magnesium chloride, and
3. a surfactant with

b. one part of the ingredients for synthetic resin foam and reacting the ingredients simultaneously to form a co-foamed product wherein the foam forming ingredient of the resin component is relied upon to produce all of the bubbles in the cofoam.

2. A method as in claim **1** wherein the synthetic resin is polyurethane.

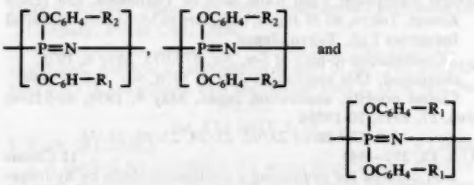
4,055,520

POLYPHOSPHAZENE BLENDS

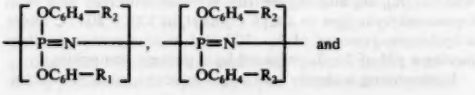
Ronald L. Dieck, and Edwin J. Quinn, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed July 14, 1976, Ser. No. 705,116
Int. Cl.[2] C08J *9/06*
U.S. Cl. 260—2.5 R **29 Claims**

1. The process of foaming a composition comprising a blend of at least one relatively elastomeric polyphosphazene copolymer having a Young's Storage Modulus in the range of 1×10^6 to 5×10^8 dynes/cm ^{2} and having randomly repeating units represented by the formulas



wherein R_1 and R_2 are the same or different and are hydrogen, a C_1-C_{10} linear or branched alkyl radical, or a C_1-C_4 linear or branched alkoxy, with the proviso that when R_2 is alkoxy, R_1 and R_2 are different; with at least one relatively stiff or rigid polyphosphazene homopolymer or copolymer having a Young's Storage Modulus in the range of 5×10^8 to 6×10^{10} dynes/cm^2 and having randomly repeating units represented by the formulas



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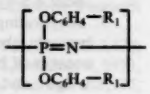
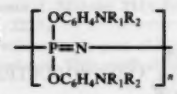




wherein R_1 and R_2 are the same or different and are hydrogen, a C_1-C_{10} linear or branched alkyl radical, or a C_1-C_4 linear or branched alkoxy, said relatively elastomeric copolymer: relatively stiff or rigid homopolymer or copolymer in a ratio of from about 1:3 to about 3:1, wherein said blend is mixed with a chemical blowing agent and the mixture heated to a temperature sufficient to decompose said blowing agent.

4,055,521

CONSTANT BOILING TERNARY COMPOSITIONS AND THE PROCESS FOR USING SUCH COMPOSITIONS IN THE PREPARATION OF POLYURETHANE FOAM

Bernard Taub, and Robert Leopold Ostrozynski, both of Williamsville, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Oct. 8, 1975, Ser. No. 620,664
Int. Cl.[2] C08J *9/14*; C09K *3/00*
U.S. Cl. 260—2.5 AF **7 Claims**

1. A composition of matter comprising from about 94.6 to about 74.0 weight percent trichlorofluoromethane, from about 2.6 to about 13 weight percent isopentane and from about 2.8 to about 13 weight percent methylene chloride.

5. The process for preparing polyurethane foam which comprises reacting and foaming a mixture of ingredients which will react to form a polyurethane foam in the presence of a blowing agent comprising the composition of claim **1**.

4,055,522

PROCESS FOR PRODUCING AN ISOCYANATE-BASED POLYMER HAVING REDUCED SMOKE GENERATION

Kaneyoshi Ashida, Chofu; Masaaki Ohtani, Kawasaki; Takashi Yokoyama, Yakuohji, and Shoichi Ohkubo, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Sept. 19, 1975, Ser. No. 614,933
Claims priority, application Japan, Sept. 26, 1974, 49-110724
Int. Cl.[2] C08G *18/14*
U.S. Cl. 260—2.5 AW **11 Claims**

1. A process for producing an isocyanate-based polymer having reduced smoke generation which comprises reacting, in the presence of a trimerization catalyst, a polymethylene polyphenylene polyisocyanate produced by the phosgenation of a precondensate of aniline and formaldehyde, the improvement which comprises the addition to the reaction system in an amount of from 3 to 20% by weight based on the amount of said polyisocyanate present, of an aromatic aldehyde having an aldehyde group and no other functional group capable of reacting with anisocyanate group.

4,055,523

POLY(D,ALKYLAMINOARYLOXYPHOSPHAZENE) POLYMERS AND FOAMS

Ronald L. Dieck; Alan B. Magnusson, and Edwin J. Quinn, all of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed Aug. 16, 1976, Ser. No. 714,526
Int. Cl.[2] C08G *79/02*
U.S. Cl. 260—2.5 R **19 Claims**

1. Poly(dialkylaminoaryloxyphosphazenes) having the formula:

wherein R_1 and R_2 are the same or different and are C_1 to C_{10} linear or branched alkyl, the radical $—NR_1R_2$ substituted on the meta or para position of the phenoxy radical and n is from 20 to 2000.

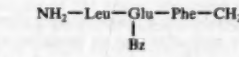
4,055,524

SYNTHESIS OF PEPTIDES

Robert L. Colescott, Bourbonnais; Emil Kaiser, Chicago; Charles D. Bossinger, Olympia Fields, and Paul I. Cook, Kankakee, all of Ill., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Continuation-in-part of Ser. No. 441,770, Feb. 12, 1974, Pat. No. 3,915,949. This application Aug. 11, 1975, Ser. No. 603,771
Int. Cl.[2] C08L *89/00*; C07C *103/52*
U.S. Cl. 260—8 **13 Claims**

1. A resin peptide having the structure:



in which

Bz is benzyl, p-methoxybenzyl, p-chlorobenzyl, p-nitrobenzyl or benzylhydryl and

R is divinylbenzene crosslinked polystyrene resin.

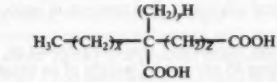
4,055,525

NOVEL POLYAMIDE ADHESIVES AND METHOD OF PREPARATION

Thomas T. Cheng, Lawrenceville, N.J., assignor to Union Camp Corporation, Wayne, N.J.

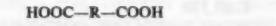
Filed June 23, 1976, Ser. No. 698,867
Int. Cl.[2] C08G *69/26*
U.S. Cl. 260—18 N **31 Claims**

1. The polyamide obtained on condensation of substantially equivalent proportions of hexamethylene diamine and a mixture of acids, said mixture comprising aliphatic dicarboxylic acids of the formula:



(I)

wherein X and Z are integers of from 0 to 15, inclusive, y is an integer of from 0 to 1 and the sum of $X + y + Z$ is 15; aliphatic dicarboxylic acids of the formula:



(II)

wherein R represents alkylene of 4 to 8 carbon atoms, inclusive and monocarboxylic acids of the formula:

(III)

wherein R' is selected from the group consisting of alkyl having 1 to 21 carbon atoms, inclusive, phenyl and hydroxy-substituted phenyl; the ratio of the moles of the acid of formula (I) to the moles of acid of formula (II) in said mixture being in the range of from 1–2:1 and the ratio of the sum of the moles of acids of formulae (I) and (II) to the moles of formula (III) being from 1:0.0–0.08; said condensation being carried out in the presence of a catalytic proportion of a catalyst selected from the group consisting of phosphoric acid, magnesium oxide and

calcium oxide and in the presence of an excess of an aqueous solvent.

4,055,526

PLANAR HEATING ELEMENT AND PRODUCTION THEREOF

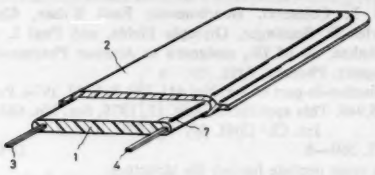
Shin Kiyokawa; Shokichi Sakaguchi, and Toru Takeuchi, all of 139, Kamihikona, Misato, Saitama, Japan

Filed Mar. 26, 1975, Ser. No. 562,046

Claims priority, application Japan, Mar. 29, 1974, 49-35373; Mar. 29, 1974, 49-35374

Int. Cl.[2] H05B *3/18*

U.S. Cl. 264—22 **8 Claims**



1. A method for producing a planar heating element which comprises uniformly melt-admixing an insulating thermoplastic resin with an electrically conductive powder wherein said electrically conductive powder is present in an amount less than 40% by weight of the thermoplastic resin, extruding the mixture to form said planar heating element and immediately cooling the extruded heating element rapidly at a temperature of less than 20° C. whereby the conductive powder is in a higher concentration near the surface of the element.

4,055,527

METHOD AND RESINOUS VEHICLES FOR ELECTRODEPOSITION

Edward L. Jozwiak, Jr., Gibsonia, and Suryya K. Das, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 28, 1975, Ser. No. 599,747

Int. Cl.[2] C08L *91/00*; C25D *13/06*

U.S. Cl. 260—23.7 A **10 Claims**

1. A process for preparing a resinous vehicle suitable for electrodeposition which comprises:

A. addition polymerizing a diene, in the presence of an oil-soluble free radical polymerization catalyst, in aqueous medium with

B. an at least 25 percent neutralized reaction product of:

1. not more than about 45 percent by weight of an unsaturated dicarboxylic acid or its anhydride with

2. at least about 55 percent by weight of a drying oil which has an iodine value of about 90 and above.

4,055,528

PHENOL-FORMALDEHYDE RESIN FOR FOUNDRY APPLICATIONS

Young D. Kim, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 23, 1976, Ser. No. 660,326

Int. Cl.[2] C08L *61/10*

U.S. Cl. 260—29.3 **5 Claims**

1. A no-bake foundry sand composition comprising:

a. a foundry aggregate;

b. between about 1 and about 5 parts by weight per 100 parts of aggregate of a phenolaldehyde resin made by:

1. heating phenol and an aldehyde in a mole ratio of aldehyde to phenol of between about 1.05 to 1 and about 1.5 to 1 in the presence of an alkaline catalyst until the free aldehyde content is less than one percent;

2. neutralizing the reaction product to a pH of about 5.5 to about 6.5 by adding an acid; and

3. dehydrating the resultant product to a viscosity of between about 1.5 and about 2.0 stokes and a water content of between about 10 and about 12 percent by weight, and

c. between about 10 and about 60 parts by weight per 100 parts of resin of a curing catalyst.

4,055,529

ADHESIVE JOINT DRESSING COMPOSITIONS CONTAINING AN ALKALI THICKENABLE POLYMER

David R. Burley, Cranbury, N.J., assignor to Tile Council of America, Inc., Princeton, N.J.

Filed Apr. 29, 1975, Ser. No. 572,660

Int. Cl.[2] C08L *33/02*

U.S. Cl. 260—29.6 RW **30 Claims**

1. a dressing composition capable of selectively adhering to substrate surfaces and forming on adherable substrate surfaces a non-porous, strain resistant, washable layer when cured, said composition comprising

i. a high molecular weight polymer in the form of an emulsion which is alkali-thickenable whereby it is capable of substantially increasing the viscosity of the composition as the pH of the composition is increased above nertral pH;

ii. a high molecular weight polymer in the form of an emulsion which is not alkali-thickenable;

iii. an alkaline agent wherein the cation or cations of said agent are mono-valent, said alkaline agent present in sufficient amounts to cause the alkali-thickenable polymer to increase the viscosity of the composition; and

iv. water;

wherein both of said polymers are room temperature curable and form water resistant films when cured and wherein the dispersion of at least one of said polymers becomes destabilized in the presence of polyvalent cations whereby its emulsion phase is broken and the droplets of the polymer no longer remain suspended in the liquid phase and wherein the total weight of polymer solids is in the range of 5–60% by weight of the total composition, the volatile components comprising at least 20% by weight of the total composition and the composition having a thixotropic rheology with a viscosity greater than about 50,000 cps at 70° F.

4,055,530

AQUEOUS DISPERSION OF ADDITION POLYMER OF AN ALPHA-BETA-ETHYLENICALLY UNSATURATED MONOMER AND SUSPENDED POLYPROPYLENE PARTICLES

Wassily Poppe, Lombard, and Ivor R. Fielding, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 27, 1975, Ser. No. 553,891

Int. Cl.[2] C08L *33/10*

U.S. Cl. 260—29.6 RW **7 Claims**

1. An aqueous coating composition comprising a dispersion of a resinous addition polymer comprising from about 0.5 to 50% by weight of an alpha, beta-ethylenically unsaturated carboxylic acid and from 25 to 99.5% by weight of at least one monomer selected from the group consisting of ethylene and soft alkyl ester of an alpha, beta-ethylenically unsaturated carboxylic acid and suspended particles of a resinous polymer of propylene containing at least 75% by weight propylene wherein said resinous polymer of propylene has a melting point of about 150° to 175° C. and an average particle size of 500 microns diameter or less.

4,055,531

PVC PLASTICIZED WITH TETRACARBOXYLATES

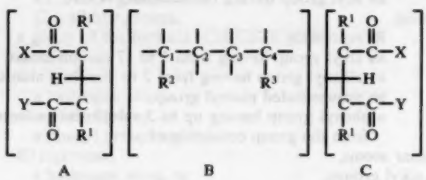
Joe B. Lavigne, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 537,051, Dec. 27, 1974, Pat. No. 4,012,438, which is a continuation-in-part of Ser. No. 163,534, July 9, 1971, abandoned, which is a continuation-in-part of Ser. No. 835,735, June 23, 1969, abandoned, Ser. No. 835,736, June 23, 1969, abandoned, and Ser. No. 835,763, June 23, 1969, abandoned. This application Oct. 4, 1976, Ser. No. 729,323

Int. Cl.[2] C08K *5/11*

U.S. Cl. 260—31.8 B 4 Claims

1. Polyvinyl chloride plastic compositions containing in amounts sufficient to impart plasticizing properties esters of the formula



A B C

wherein A and C are monovalent succinic acid groups having attachment to B at either of the two carbon atoms of A or C having unsatisfied valences and a hydrogen atom attached to the other unsatisfied carbon atom; and wherein B is a connecting alkane or cycloalkane group of 8 to 30 carbon atoms having 2 of the above-described monovalent groups A and C, which may be the same or different, attached at carbon atoms 1 and 2 or at carbon atoms 1 and 3; and optionally having carbon atom 1 and carbon atom 4 connected by a 1–8 carbon methylene bridge; the remainder of the unsatisfied carbon valences of said bivalent hydrocarbon group being attached to hydrogen atoms; and wherein R^1 is H and R^2 and R^3 are H or the same or different alkyl groups; X and Y are the same or different groups having the structure: —OR, in which R is an alkyl group having from 1 to 8 carbon atoms.

4,055,532

STABILIZED ACETONITRILE SOLVENT CONTAINING POLYACRYLONITRILE COMPOSITIONS AND METHOD OF FORMING SAME

Darrell R. Thompson, Somerville, N.J., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 367,088, June 4, 1973, Pat. No. 3,917,553, which is a continuation of Ser. No. 136,620, April 22, 1971, abandoned. This application Aug. 12, 1975, Ser. No. 603,977

The portion of the term of this patent subsequent to Nov. 4, 1992, has been disclaimed.

Int. Cl.[2] C08L *33/20*

U.S. Cl. 260—32.4 5 Claims

1. A method of forming stabilized film or fiber forming polyacrylonitrile compositions which comprises the steps of adding to a solvent which consists essentially of acetonitrile from about 0.01 to about 3 weight percent based on the weight of said polyacrylonitrile, of a sulfur-containing stabilizer selected from the group consisting dodecanethiol, mercaptosuccinic acid, benzenethiol, thiodiglycol, dibehenyl thiodipropionate, distearyl thiodipropionate, and diethoxyethyl thiodipropionate; adding polyacrylonitrile which contains at least 85 percent acrylonitrile and up to about 15 weight percent of at least one other ethylenically unsaturated material copolymerized therewith; and heating and mixing the resultant mixture under superatomospheric pressure to a temperature above about 80 degrees centigrade and below the degradation temperature of said polyacrylonitrile to produce a solution.

4,055,533

POTTERY-LIKE COATING COMPOSITION

Laurence A. Malone, 2111 Jefferson Davis Highway, Arlington, Va. 22202

Continuation-in-part of Ser. No. 672,068, March 30, 1976, abandoned. This application Apr. 5, 1977, Ser. No. 784,845

Int. Cl.[2] C08L *63/02*

U.S. Cl. 260—37 EP 3 Claims

1. A composition capable of hardening into a hard, pottery-like material and comprising a mixture of a first component which comprises:

22.0–36.1% by weight of an epoxy resin having a viscosity of 100–160 poise and an epoxide equivalent of 185–192;
2.1–4.0% by weight of a semi-solid epoxy resin having an epoxide equivalent of 230–280;
0.3–1.4% by weight of hexachlorobutadiene;
0.5–1.0% by weight of zinc oxide;
0.6–1.6% by weight of white lead;
32.1–52.1% by weight of calcium carbonate;
0.9–2.0% by weight of titanium dioxide;
0.5–0.9% by weight of barium sulphate;
0.3–0.5% by weight of mineral oil; and
0.2–0.5% by weight of acetic acid; and

a second component which comprises:

15.0–23.3% by weight of a polyamide resin having an equivalent weight of 225 grams per amine hydrogen;
23.0–61.2% by weight of calcium carbonate;
1.5–3.0% by weight of epichlorohydrin;
0.5–3.5% by weight of bisphenol-A;
1.5–3.5% by weight of diacetamide;
1.5–2.0% by weight of aminophenol; and
0.4–3.5% by weight of amido-aldehyde.

4,055,534

UPGRADED AROMATIC POLYESTER MATERIAL IN POWDER FORM

Arthur H. Gerber, University Hts., Ohio, assignor to Horizons Incorporated, a division of Horizons Research Incorporated, Cleveland, Ohio

Filed Nov. 14, 1975, Ser. No. 631,996

Int. Cl.[2] C08G *18/08, 18/82;* C08K *5/52;* C08G *18/42*

U.S. Cl. 260—45.7 PH 16 Claims

1. A process for preparing a polyester in powder form by upgrading the molecular-weight of an aromatic polyester or a mixture of aromatic polyesters with an initial molecular weight of about 10,000 to a product possessing a relative viscosity of at least 1.8 as measured in m-cresol at 31° C. which comprises: reacting said polyester with at least one reagent selected from the group consisting of (1) diisocyanates represented by the formula $R(NCO)_2$ and at least one difunctional compound in which the functionality is selected from the group consisting of —OH, —NH, —COOH and mixtures thereof; and (2) the reaction products of said diisocyanate and said difunctional compound alone or with at least one other difunctional compound; effecting said reaction in a polar aprotic solvent at temperatures of 100°–180° C., the relative proportions of the reactants being such that the total number of equivalents of isocyanate groups is substantially equal to the total number of equivalents of —OH, —NH, and/or —COOH reactive sites present in the polyester and difunctional compounds, the difunctional compound being present in the amount of 1 to 50 percent by weight based on the weight of said polyester, and R represents a divalent number selected from the group consisting of alkylene, cycloalkylene, alkenylene, cycloalkenylene, arylalkylene, arylene, biarylene, and all the R groups are not required to be the same and thereafter removing said solvent.

4,055,535

PROCESS FOR PRODUCING STABILIZED OLEFIN TERPOLYMERS AND STABILIZED OLEFIN TERPOLYMERS PRODUCED ACCORDING TO SAID PROCESS

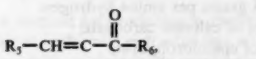
Sergio Arrighetti; Sebastiano Cesca; Giuseppe Ghetti, and Eugenio Vajna, all of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Milan, Italy

Division of Ser. No. 275,936, July 28, 1972, Pat. No. 3,892,712. This application Apr. 11, 1975, Ser. No. 567,299
Claims priority, application Italy, July 31, 1971, 27014/71
Int. Cl.[2] C08L 9/00
U.S. Cl. 260—45.7 R .10 Claims

1. A process for preparing an olefin terpolymer which is stabilized against oxidative aging, which comprises reacting in a hydrocarbon solvent and at a temperature between 0° and 150° C.

a. a terpolymer of ethylene, another alpha olefin, and a polyene selected from the group consisting of dehydro-iso-dicyclopentadiene and 2-(2',4'-dimethyl-penta 1',3' dienyl-)-norborn-5-ene, having in addition to a double bond for participating in the terpolymer formation, conjugated double bonds in the cyclopentadienyl substituent, with

b. a dienophilic agent of the general formula:



wherein R_5 can be hydrogen or alkyl, aryl, cycloalkyl or arylalkyl radicals having up to 8 carbon atoms and R_6 can be alkyl, alkenyl, cycloalkyl, aryl, or arylalkyl radical having up to 8 carbon atoms.

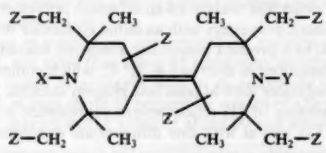
4,055,536

4,4'-BIPIPERIDYLIDENE DERIVATIVES AND THEIR USE AS STABILIZERS

Nobuo Soma; Takao Yoshioka; Tomoyuki Kurumada, and Syoji Morimura, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed July 30, 1976, Ser. No. 710,313
Claims priority, application United Kingdom, Aug. 8, 1975, 33228/75
Int. Cl.[2] C07D 401/04; C08J 3/20
U.S. Cl. 260—45.8 N 13 Claims

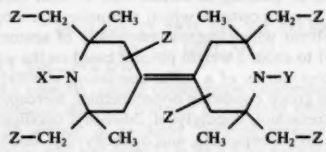
1. A 4,4'-bipiperidylidene compound having the formula (I):



(I)

wherein
each of the symbols Z represents
a hydrogen atom, or
an alkyl group having from 1 to 3 carbon atoms; and
X and Y are the same or different and each represents
a hydrogen atom,
an oxyl group,
a hydroxy group,
an alkyl group having from 1 to 18 carbon atoms,
an alkenyl group having from 3 to 6 carbon atoms,
an alkoxyalkyl group having from 1 to 3 carbon atoms in its alkyl moiety and from 1 to 18 carbon atoms in its alkoxy moiety,
a cyanoalkyl group having 2 or 3 carbon atoms,
an alkanoyl group having from 1 to 12 carbon atoms,
an alkenoyl group having 3 or 4 carbon atoms,
an 2,3-epoxypropyl group,
an unsubstituted aralkyl group having 7 or 8 carbon atoms,
an aralkyl group having 7 or 8 carbon atoms and having in its aryl moiety up to 3 substituents selected from the group consisting of chlorine atoms, C_{1-4} alkyl groups and C_{1-8} alkoxy groups,
a group of the formula $—CH_2CH(R^1)OR^2$
wherein
R^1 represents
a hydrogen atom,
a methyl group, or
a phenyl group, and
R^2 represents
a hydrogen atom, or
an acyl group having the formula $—COR^5$
wherein
R^5 represents
an alkyl group having from 1 to 17 carbon atoms,
an alkenyl group having from 2 to 4 carbon atoms,
an unsubstituted phenyl group,
a phenyl group having up to 3 substituents selected from the group consisting of
chlorine atoms,
C_{1-4} alkyl groups,
C_{1-8} alkoxy groups and
hydroxy groups,
an unsubstituted aralkyl group having 7 or 8 carbon atoms,
an aralkyl group having 7 or 8 carbon atoms and having in its aryl moiety up to 3 substituents selected from the group consisting of
chlorine atoms,
C_{1-4} alkyl groups,
C_{1-8} alkoxy groups, and hydroxy groups,
a styryl group, or
a cyclohexyl group,
a group of the formula $—CH_2COOR^3$
wherein
R^3 represents
an alkyl group having from 1 to 18 carbon atoms,
an alkenyl group having from 3 to 6 carbon atoms,
a phenyl group,
an aralkyl group having 7 or 8 carbon atoms, or a cyclohexyl group, or
a group of the formula $—COOR^4$
wherein
R^4 represents
an alkyl group having from 1 to 8 carbon atoms,
a benzyl group,
a phenyl group, or
a cyclohexyl group
and an acid addition salt thereof.

7. An organic polymer composition stabilized against photo- and thermal deterioration by the incorporation of a stabilizing amount of a 4,4'-bipiperidylidene derivative having the formula (I)



(I)

wherein
each of the symbols Z represents a hydrogen atom, or
an alkyl group having from 1 to 3 carbon atoms, and
X and y are the same or different and each repesents
a hydrogen atom,
an oxyl group,
a hydroxy group,

an alkyl group having from 1 to 18 carbon atoms,
an alkenyl group having from 3 to 6 carbon atoms,
an alkoxyalkyl group having from 1 to 3 carbon atoms in its alkyl moiety and from 1 to 18 carbon atoms in its alkoxy moiety;
a cyanoalkyl group having 2 or 3 carbon atoms,
an alkanoyl group having from 1 to 23 carbon atoms,
an alkenoyl group having 3 or 4 carbon atoms,
an 2,3-epoxypropyl group,
an unsubstituted aralkyl group having 7 or 8 carbon atoms,
an aralkyl group having 7 or 8 carbon atoms and having in its aryl moiety up to 3 substituents selected from the group consisting of
chlorine atoms,
C_{1-4} alkyl groups and
C_{1-8} alkoxy groups,
a group of the formula $-CH_2CH(R^1)OR^2$
wherein
R^1 represents
a hydrogen atom,
a methyl group, or
a phenyl group, and
R^2 represents
a hydrogen atom, or
an acyl group having the formula $-COR^5$
wherein
R^5 represents
an alkyl group having from 1 to 17 carbon atoms,
an alkenyl group having from 2 to 4 carbon atoms,
an unsubstituted phenyl group,
a phenyl group having up to 3 substituents selected from the group consisting of chlorine atoms,
C_{1-4} alkyl groups,
C_{1-8} alkoxy groups and
hydroxy groups,
an unsubstituted aralkyl group having 7 or 8 carbon atoms,
an aralkyl group having 7 or 8 carbon atoms and having in its aryl moiety up to 3 substituents selected from the group consisting of chlorine atoms,
C_{1-4} alkyl groups,
C_{1-8} alkoxy groups and hydroxy groups,
a styryl group, or
a cyclohexyl group,
a group of the formula $-CH_2COOR^3$
wherein
R^3 represents
an alkyl group having from 1 to 18 carbon atoms,
an alkenyl group having from 3 to 6 carbon atoms,
a phenyl group,
an aralkyl group having 7 or 8 carbon atoms, and a cyclohexyl group, or
a group of the formula $-COOR^4$
wherein
R^4 represents
an alkyl group having from 1 to 8 carbon atoms,
a benzyl group,
a phenyl group, or
a cyclohexyl group,
and an acid addition salt thereof.

4,055,537

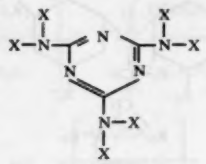
SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

William Joseph Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 4, 1977, Ser. No. 774,556
Int. Cl.² C08K *5/34*
U.S. Cl. 260—45.75 D **18 Claims**

1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with a smoke retardant amount of

A. at least one melamine molybdate or substituted melamine molybdate, the melamine or substituted melamine having the formula



wherein X is hydrogen or an alkyl, alicyclic, aralkyl, alkaryl, aryl or heterocyclic group containing from 1 to 10 atoms of C, O, S and/ or N, and with two X's on each of one or more nitrogen atoms optionally being joined together to form a heterocyclic ring; and

B. at least one compound selected from the group consisting of Bi_2O_3, CdO, $MnCO_3$, SnO_2, Ta_2O_5, TiO_2, H_2WO_4, ZnO, Zn_2SiO_4, zinc borate, and hydrates thereof.

4,055,538

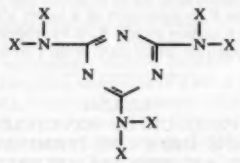
SMOKE RETARDANT VINYL CHLORIDE AND VINYLIDENE CHLORIDE POLYMER COMPOSITIONS

William Joseph Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 4, 1977, Ser. No. 774,554
Int. Cl.² C08K *5/34*
U.S. Cl. 260—45.75 P **12 Claims**

1. A smoke retardant composition comprising a vinyl chloride or vinylidene chloride polymer together with a smoke retardant amount of

A. at least one melamine molybdate or substituted melamine molybdate, the melamine or substituted melamine having the formula



wherein X is hydrogen or an alkyl, alicyclic, aralkyl, alkaryl, aryl or heterocyclic group containing from 1 to 10 atoms of C,O,S and/or N, and with two X's on each of one or more nitrogen atoms optionally being joined together to form a heterocyclic ring; and

B. at least one compound selected from the group consisting of iron oxide, $FeSO_4$, $Fe_2(SO_4)_3$, iron (III) acetylacetonate, and hydrates thereof.

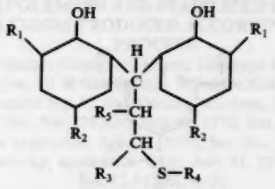
4,055,539

ALKYLIDENE-BISPHENOLS CONTAINING SULPHUR, AND THEIR USE AS STABILIZERS

Siegfried Rosenberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 610,498, Sept. 4, 1975, abandoned. This application May 27, 1976, Ser. No. 690,470
Claims priority, application Switzerland, Sept. 16, 1974, 12573/74
Int. Cl.² C08K *5/05, 5/13;* C07C *149/36*
U.S. Cl. 260—45.95 C **9 Claims**

1. A compound of the general formula I



wherein R_1 is an alkyl group which has 1 to 18 carbon atoms and which is not branched in the α-position, R_2 denotes a linear or branched alkyl group having 1 to 8 carbon atoms, or a hydrogen atom, R_3 denotes an alkyl group having 1 to 6 carbon atoms and R_5 denotes a hydrogen atom or an alkyl group having 1 to 6 carbon atoms, and R_4 denotes a linear or branched alkyl group having 1 to 20 carbon atoms wherein the carbon chain can be interrupted by sulphur atoms.

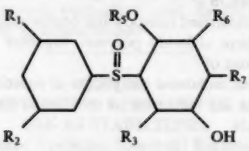
4,055,540

5-HYDROXYDIPHENYL SULFOXIDE COMPOSITIONS

Dwight William Chasar, Northfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 2, 1976, Ser. No. 737,954
Int. Cl.[2] C08K *5/41*
U.S. Cl. 260—45.95 C **8 Claims**

1. A polyolefin containing a stabilizing amount of a 5-hydroxydiphenyl sulfoxide of the formula



wherein R_1 is hydrogen, R_2 is a lower alkyl or halogen as defined, wherein R_3 is hydrogen or a lower alkyl, R_5 is lower alkyl from 1 to 6 carbon atoms, R_6 is hydrogen or lower alkyl and R_7 is hydrogen or lower alkyl from 1 to 6 carbon atoms.

4,055,541

REACTION PRODUCTS OF NON-CYCLOALIPHATIC EPOXY RESINS AND AMINE-TERMINATED LIQUID POLYMERS AND PROCESS FOR PREPARATION THEREOF

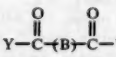
Changkiu Keith Riew, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 586,723, June 13, 1975, abandoned. This application July 14, 1975, Ser. No. 595,445
Int. Cl.[2] C08L *63/02*
U.S. Cl. 260—47 EN **22 Claims**

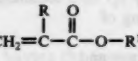
1. A composition comprising

A. 100 parts by weight of a non-cycloaliphatic epoxy resin containing at least an average of about 1.7 oxirane groups per molecule, said resin having an epoxy equivalent weight from about 70 to about 6000, and

B. from about 1 to about 1,000 parts by weight of an amine-terminated liquid polymer containing an average from about 1.7 to about 3 amine groups per molecule, said groups being primary, secondary or a mixture thereof, and said polymer having the formula



wherein Y is a univalent radical obtained by removing hydrogen from an amine group of an aliphatic, alicyclic, heterocyclic or aromatic amine containing from 2 to 20 carbon atoms and at least two amine groups, at least two of said amine groups being primary, secondary or a mixture thereof, and B is a polymeric backbone consisting of carbon-carbon linkages and containing polymerized units of at least one vinylidene monomer having at least one terminal $CH_2{=}C<$ group, said monomer being selected from the group consisting of (a) monoolefins containing 2 to 14 carbon atoms, (b) dienes containing 4 to 10 carbon atoms, (c) vinyl and allyl esters of carboxylic acids containing 2 to 8 carbon atoms, (d) vinyl and allyl ethers of alkyl radicals containing 1 to 8 carbon atoms, and (e) acrylic acids and acrylates having the formula



said R being hydrogen or an alkyl radical containing 1 to 3 carbon atoms and said R^1 being hydrogen, an alkyl radical containing 1 to 18 carbon atoms, or an alkoxyalkyl, alkylthioalkyl or cyanoalkyl radical containing 2 to 12 carbon atoms.

4,055,542

ANAEROBICALLY CURABLE SEALING COMPOSITION CONTAINING (A) ACRYLATE DERIVATIVE OF BISPHENOL A AND (B) HYDROXYACRYLATE

Tsutomu Saito, Hachioji, Japan, assignor to Three Bond Co., Ltd., Tokyo, Japan

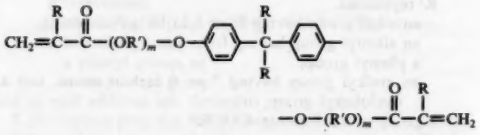
Filed Feb. 23, 1976, Ser. No. 660,435
Claims priority, application Japan, Feb. 24, 1975, 50-22663
The portion of the term of this patent subsequent to June 17, 1992, has been disclaimed.
Int. Cl.[2] C08F *3/62, 3/64*
U.S. Cl. 260—47 UA **8 Claims**

1. An anaerobically curable sealing composition comprising a polymerisable monomer and an organic peroxide, characterized in that said monomer is a mixture of the following monomers (A) and (B), the ratio of the amounts of which are:

Monomer (A) : 95 to 50 parts by weight,

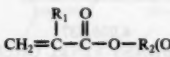
Monomer (B) : 50 to 5 parts by weight.

monomer (A) having the general formula of

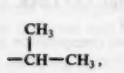


wherein, R represents hydrogen or alkyl radical having from 1 to 4 carbon atoms, R′ represents alkylene radical having from 2 to 4 carbon atoms and *m* represents an integer of from 2 to 8,

monomer (B) having the general formula of



in which, R_1 indicates hydrogen or alkyl radical having from 1 to 4 carbon atoms, R_2 indicates $-CH_2-CH_3$, $-CH_2-CH_2-CH_3$ or



and *n* indicates an integer of from 1 to 3.

4,055,543

CHAIN-EXTENDING SCHIFF BASE TERMINATED POLYIMIDES AND METHOD OF PREPARATION

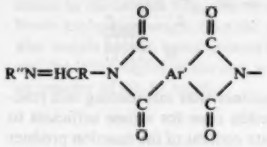
Gaetano Francis D'Alelio, 2011 E. Cedar St., South Bend, Ind. 46617

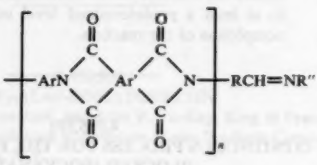
Continuation-in-part of Ser. No. 363,800, May 25, 1973, Pat. No. 3,998,786, and a continuation-in-part of Ser. No. 363,801, May 25, 1973, Pat. No. 3,897,395. This application May 27, 1975, Ser. No. 581,095

Int. Cl.[2] C08G 73/10, 73/12

U.S. Cl. 260—47 CP 14 Claims

1. A polymeric chain-extending process comprising: heating a polyimide, at a temperature in the range of about 150°–450° C, of the formula:





wherein

Ar′ is a tetravalent aromatic organic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in the Ar′ radical,

Ar is a divalent aromatic organic radical,

R is a hydrocarbon radical of 1 to 12 carbon atoms, and

R″ is a hydrocarbon radical of 1 to 12 carbon atoms, and

n is a positive integer of at least one.

4,055,544

PROCESS FOR MAKING POLYCARBONATES USING AMMONIA OR AMMONIA COMPOUNDS AS THE CATALYSTS

Joseph McClendon Baggett, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 12, 1976, Ser. No. 704,202

Int. Cl.[2] C08G 63/62

U.S. Cl. 260—47 XA 6 Claims

1. A process for making thermoplastic aromatic polycarbonates which comprises reacting under interfacial polycarbonate-forming conditions

1. a carbonyl halide,
2. a dihydric phenol or mixtures of dihydric phenols, and
3. a catalytic amount of ammonia or an ammonium compound which liberates ammonia under the conditions of the reaction.

4,055,545

SMOKE-SUPPRESSANT ADDITIVES FOR POLYPHOSPHAZENES

Ronald L. Dieck, and Edwin J. Quinn, both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

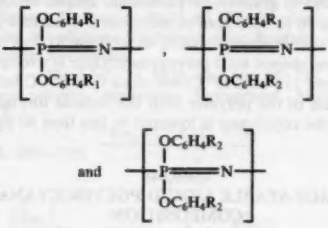
Division of Ser. No. 712,149, Aug. 6, 1976, Pat. No. 4,026,838. This application Dec. 20, 1976, Ser. No. 752,569

Int. Cl.[2] C08G 79/04

U.S. Cl. 260—47 P 13 Claims

1. A poly(aryloxphosphazene) smoke suppressed composition comprising

a. an aryloxyphosphazene homopolymer or copolymer of the formula



wherein R_1 and R_2 are the same or different and are hydrogen, a C_1-C_{10} linear or branched alkyl radical or a C_1-C_4 linear or branched alkoxy radical, said R_1 and R_2 substituted in any sterically permissible position on the phenoxy group; and

b. a normally solid carboxylic acid.

4,055,546

NOVEL THERMOSETTING RESINS AND PROCESS FOR PREPARING THE SAME

Tzong Jeng Chu, and Susumu Konii, both of Shimodate, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 302,207, Oct. 30, 1972, Pat. No. 3,950,309. This application Jan. 5, 1976, Ser. No. 646,671

Claims priority, application Japan, Oct. 29, 1971, 46-85520; Oct. 29, 1971, 46-85521

Int. Cl.[2] C08G 8/28, 10/04

U.S. Cl. 260—51 R 14 Claims

1. A thermosetting resin, the thermoset resin obtained therefrom having such a thermal resistance that the temperature at which the thermoset resin is caused to show a weight loss of 6% by heating at a temperature elevation rate of 10° C. per minute is at least 400° C., which comprises a reaction product of a novolak which is obtained by the reaction of a phenol and an aldehyde in the presence of an acid catalyst or a novolak type aryl-modified phenolic resin which is obtained by the reaction of a phenol and an aromatic hydrocarbon-aldehyde condensation initial-stage reaction product with a member selected from the group consisting of a silicic acid ester of the formula $Si(OR)_4$ wherein R represents alkyl or aryl and a mixture of a silicic acid ester of the formula as defined above and a titanic acid ester of the formula $Ti(OR)_4$ wherein R has the same meaning as defined above, said reaction product having such structure that the silicon is or silicon and titanium are bonded directly to oxygens of the phenolic hydroxyl groups while 20 – 70 mole %, based on the amount of phenol present in the starting system to be reacted with said member, of the phenolic hydroxyl groups, in terms of the amount of phenol, are left in the free form.

4,055,547

REMOVING ODOROUS FORMALDEHYDE FROM STABILIZED SHAPED POLYOXYMETHYLENES

Helmut Doerfel, 152 Bergstrasse, 6900 Heidelberg 1; Franz Schmidt, 3 Trommstrasse, 6800 Mannheim 1; Wilhelm Schuette, 5 Frankstrasse, 6720 Speyer; Claus Cordes, 13 Halbergstrasse, 6719 Weisenheim, and Wolfgang Schenk, 1 Carl-Goerdeler-Strasse, 6830 Schwetzingen, all of Germany

Filed June 20, 1975, Ser. No. 588,819

Claims priority, application Germany, July 29, 1974, 2436384

Int. Cl.[2] C08G 2/28

U.S. Cl. 260—67 FP 5 Claims

1. In a method for removing odorous monomeric formaldehyde from stabilized polyoxymethylenes wherein a polyoxymethylene copolymer is prepared by copolymerizing formaldehyde or trioxane with comonomers selected from 1,3-dioxo-

lane, ethyleneoxide, 1,3-dioxepane or polydioxolane, said copolymer is subjected to stabilization by incorporating antioxidants and thermostabilizers in extruders and the copolymers are converted to granules or particulate shaped articles containing from 50 to 1000 ppm of monomeric formaldehyde, the improvement comprising: causing an inert gas to flow over the stabilized and shaped solid polyoxymethylene at a temperature of from about 110° to 140° C, but more than 25° C below the melting point of the polymer until the volatile formaldehyde content of the copolymer is lowered to less than 60 ppm.

4,055,548

STORAGE-STABLE LIQUID POLYISOCYANATE COMPOSITION

Peter S. Carleton, Branford; James H. Ewen, Jr., New Haven, and Harold E. Reymore, Jr., Wallingford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 17, 1976, Ser. No. 724,401
Int. Cl.[2] C08G *18/76, 18/14;* **B29D** *27/00*
U.S. Cl. 260—77.5 AT **6 Claims**

1. A liquid isocyanate prepolymer composition which has a viscosity determined in centipoises at 25° C of from about 130 to about 2800 and which can be subjected to many freeze-thaw cycles with little or no solids formation comprising the product obtained by bringing together and reacting (i) a polymethylene polyphenylisocyanate containing from about 65 to about 85 percent by weight of methylenebis(phenylisocyanate) the remainder of said polymethylene polyphenylisocyanates having a functionality greater than 2 and (ii) from about 0.0185 to about 0.15 equivalent, per equivalent of said polyphenylisocyanate, of a polyoxyethyleneglycol having an average molecular weight from about 200 to about 600.

4,055,549

THERMOPLASTICALLY PROCESSABLE POLYURETHANES BASED ON TOLYLENE DIISOCYANATE

Rene Roberts, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 5, 1976, Ser. No. 683,638
Int. Cl.[2] C08G *18/42, 18/82, 18/10*
U.S. Cl. 260—77.5 AN **16 Claims**

1. A method for producing a thermoplastically processable polyurethane, which comprises simultaneously reacting

a. a polycaprolactone diol having a molecular weight of from 1,000 to 4,000;

b. a low molecular weight diol chain extender;

c. tolylene diisocyanate; and

d. water,

the mole ratio of a:b:c:d employed in the reaction being 1:3–6-:8–14:2–7 and the ratio of c:d employed in the reaction being from 2:1 to 4:1.

4,055,550

CONTINUOUS PROCESS FOR THE PRODUCTION OF PARTIALLY BLOCKED ISOCYANATES

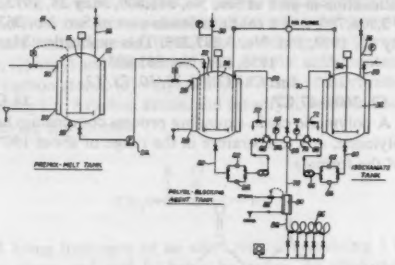
K. A. Pai Panandiker, Maple Grove, Minn., and David E. Tweet, Carpentersville, Ill., assignors to Cargill, Incorporated, Minneapolis, Minn.

Filed Dec. 8, 1976, Ser. No. 748,496
Int. Cl.[2] C08G *18/02*
U.S. Cl. 260—77.5 AA **11 Claims**

1. A method for manufacturing partially blocked isocyanate curing agents which are the reaction product of a polyfunctional isocyanate and a blocking agent for the isocyanate which is capable of splitting from the curing agent at elevated temperature to regenerate isocyanate functionality, comprising the steps of

separately and continuously metering a polyisocyanate and a blocking agent for said polyisocyanate into a reaction zone in predetermined stoichiometric isocyanate excess to provide a reaction mixture in the reaction zone at reaction temperature,

continuously withdrawing the reaction mixture from said reaction zone to provide a partially blocked isocyanate



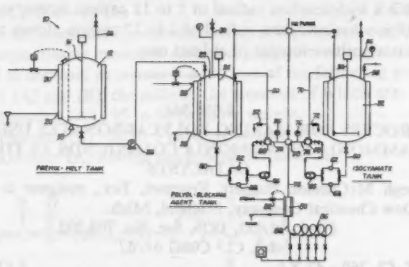
curing agent reaction product after maintaining said reaction mixture in the reaction zone for a time sufficient to reduce the free isocyanate content of the reaction product to at least a predetermined level indicating substantial completion of the reaction.

4,055,551

CONTINUOUS PROCESS FOR THE PRODUCTION OF BLOCKED ISOCYANATES

K. A. Pai Panandiker, Maple Grove, Minn., and David E. Tweet, Carpentersville, Ill., assignors to Cargill, Incorporated, Minneapolis, Minn.

Filed Dec. 8, 1976, Ser. No. 748,497
Int. Cl.[2] C08G *18/02*
U.S. Cl. 260—77.5 AA **11 Claims**



1. A method for manufacturing blocked isocyanate curing agents which are the reaction product of a polyfunctional isocyanate and a blocking agent for the isocyanate which is capable of splitting from the curing agent at elevated temperature to regenerate isocyanate functionality, comprising the steps of

separately and continuously metering a polyisocyanate and a blocking agent for said polyisocyanate into a reaction zone in stoichiometric proportion to provide a reaction mixture in the reaction zone at reaction temperature, said stoichiometric proportion being based on the deficient or excess isocyanate functionality of said reaction mixture, and

continuously withdrawing the reaction mixture from said reaction zone to provide a blocked isocyanate curing agent reaction product after maintaining said reaction mixture in the reaction zone for a time sufficient to reduce the free isocyanate functionality of the reaction product to at least a predetermined level indicating substantial completion of the blocking reaction.

4,055,552

HOT-MELT ADHESIVES BASED ON ANIONIC TERPOLYMERS OF LACTAMS

Zbyněk Bukač; Jan Šebenda, both of Prague, and Richard Suchý, Liberec, all of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed May 26, 1976, Ser. No. 689,964

Claims priority, application Czechoslovakia, June 10, 1975, 4055/75

Int. Cl.[2] C08G *69/14*

U.S. Cl. 260—78 L 3 Claims

1. Hot-melt adhesive from an anionic terpolyamide of 10–90 mol% 8-octanolactam and 90–10 mol% of at least two different anionically polymerizable lactams having 6 or more carbon atoms in the lactam ring, one of said latter lactams being of a lower molecular weight than the other, the latter lower molecular weight lactam being present in an amount of 10–60 mol% and the latter higher molecular weight lactam being present in an amount of 20–50 mol%.

4,055,553

$(GLY_3\text{-}ALA)^1$-SOMATOSTATIN

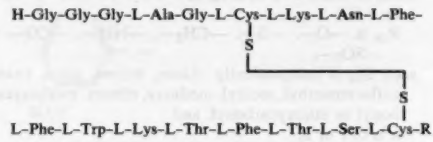
Sie-Yearl Chai, Royersford, and John P. Yardley, King of Prussia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,254

Int. Cl.[2] C07C *103/52*; A61K *37/00*

U.S. Cl. 260—112.5 S 3 Claims

1. A compound selected from the group consisting of



in which R is dimethylamino, alkylamino of 1 to 5 carbon atoms or phenethylamino, the corresponding linear heptadecapeptide, to protamine zinc, protamine aluminum and non-toxic acid addition salts thereof.

4,055,554

GEL STRENGTH ENHANCER FOR GELATIN COMPOSITIONS INCLUDING AN OXIDIZED POLYSACCHARIDE

Gerald J. Helmstetter, Bridgewater, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Sept. 10, 1976, Ser. No. 721,954

Int. Cl.[2] C09H *7/00*

U.S. Cl. 260—117 12 Claims

1. A method of hardening gelatin which comprises the step of adding to the gelatin a polysaccharide which has been oxidized to an extent that 0.5 to 100% of the original anhydroglucose units have been converted to dialdehyde units and subsequently subjected to chemical modification under aqueous alkaline conditions with a mono-reactive reagent to a degree of substitution of at least 0.005 wherein the chemical modification is one which results in a polysaccharide derivative selected from the group consisting of succinate, acetate, alkenyl succinate, diethylaminoethyl ether, phthalate, sulfonate, carboxymethylated and chlorinated derivatives.

4,055,555

SOLUBILIZATION OF CASEIN

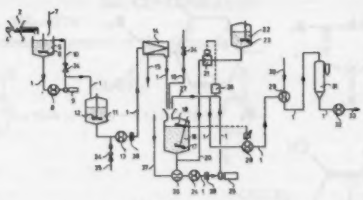
Ernest Badertscher, Orbe; Michel Chavéron, Vevey, and Valentin Wenner, La Tour-de-Peilz, all of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Mar. 4, 1976, Ser. No. 663,715

Claims priority, application Switzerland, Mar. 20, 1975, 3555/75

Int. Cl.[2] A23J *3/00*

U.S. Cl. 260—119 10 Claims



1. A process for solubilizing a suspension of a casein selected from the group consisting of casein precipitated from milk by addition of calcium salts to said milk or rennet casein, which comprises suspending said casein in powder form in an aqueous medium, the casein suspension containing at most 270 g of casein per liter of aqueous medium, and leaving the casein suspension to age for at least 10 minutes, after which a calcium-complexing solubilizing agent is progressively added to the suspension until a homogeneous solution is obtained.

4,055,556

MONOAZO AND DISAZO COMPOUNDS HAVING OPTIONALLY FURTHER SUBSTITUTED 2-ACYL-, CARBOXY- OR CYANO-BENZOTHIENYL DIAZO COMPONENT RADICALS

Max Aeberli, Riehen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

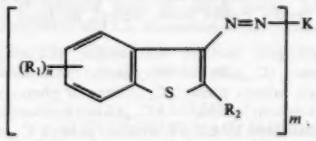
Filed Sept. 3, 1974, Ser. No. 502,445

Claims priority, application Switzerland, Sept. 6, 1973, 12814/73

Int. Cl.[2] C09B *29/20, 29/32, 29/36, 33/14*

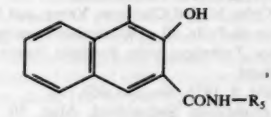
U.S. Cl. 260—152 53 Claims

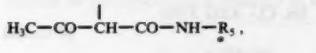
1. A compound of the formula

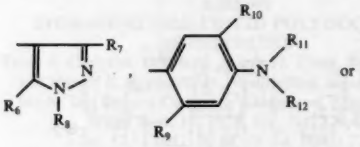


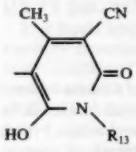
wherein each R_1 is independently halo, $C_{1\text{-}8}$alkyl, substituted $C_{1\text{-}8}$alkyl, $C_{5\text{-}8}$cycloalkyl, substituted $C_{5\text{-}8}$cycloalkyl, $C_{1\text{-}8}$alkoxy, substituted $C_{1\text{-}8}$alkoxy, $C_{5\text{-}8}$cycloalkyloxy, substituted $C_{5\text{-}8}$cycloalkyloxy, trifluoromethyl or nitro,

R_2 is carboxy, carbamoyl, ($C_{1\text{-}8}$alkyl)carbamoyl, (substituted $C_{1\text{-}8}$alkyl)carbamoyl, ($C_{5\text{-}8}$cycloalkyl)carbamoyl, (substituted $C_{5\text{-}8}$cycloalkyl)carbamoyl, di-($C_{1\text{-}8}$alkyl)carbamoyl, di-(substituted $C_{1\text{-}8}$alkyl)carbamoyl, N-$C_{1\text{-}8}$alkyl-N-(substituted $C_{1\text{-}8}$alkyl)carbamoyl, phenylcarbamoyl, substituted phenylcarbamoyl, ($C_{1\text{-}8}$alkoxy)carbonyl, (substituted $C_{1\text{-}8}$alkoxy)carbonyl, ($C_{5\text{-}8}$cycloalkyloxy)carbonyl, (substituted $C_{5\text{-}8}$cycloalkyloxy)carbonyl, phenoxycarbonyl, substituted phenoxycarbonyl or cyano,

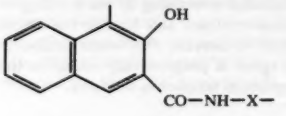
K is 

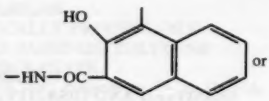


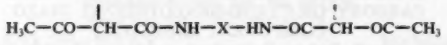




when m is 1 and is







when *m* is 2,

wherein R_5 is phenyl; phenyl substituted by 1-3 substituents each of which is independently chloro, bromo, methyl, methoxy or trifluoromethyl or benzimidazolonyl-5,

R_6 is hydroxy or amino,

R_7 is hydrogen, methyl, phenyl, methoxycarbonyl or ethoxycarbonyl,

R_8 is hydrogen, methyl, ethyl, phenyl or phenyl substituted by 1-3 substituents each of which is independently chloro, bromo, cyano, nitro, methyl, methoxy or ethoxy,

R_9 is hydrogen; methyl; formamido; (C_{1-4}alkyl)carbonylamino; (C_{1-4}alkyl)carbonylamino monosubstituted by chloro, bromo, phenyl, C_{1-4}alkoxy or phenoxy; (C_{1-4}alkoxy)carbonylamino; (C_{1-4}alkoxy)carbonylamino monosubstituted by chloro, bromo, phenyl, C_{1-4}alkoxy or phenoxy; C_{1-4}alkylsulfonylamino or C_{1-4}alkylsulfonylamino monosubstituted by chloro, bromo, phenyl, C_{1-4}alkoxy or phenoxy,

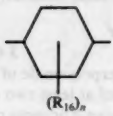
R_{10} is hydrogen, methoxy or ethoxy,

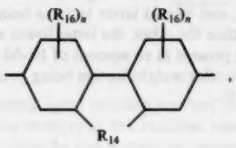
R_{11} is C_{1-4}alkyl or C_{1-4}alkyl or C_{1-4}alkyl monosubstituted by chloro, bromo, cyano, hydroxy, methoxy, ethoxy, phenyl, phenoxy, (C_{1-4}alkyl)carbonylamino, (C_{1-4}alkyl)carbonyloxy, (C_{1-4}alkoxy)carbonyl or (C_{1-4}alkoxy)carbonyloxy,

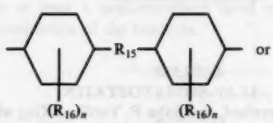
R_{12} is hydrogen, C_{1-4}alkyl or C_{1-4}alkyl monosubstituted by chloro, bromo, cyano, hydroxy, methoxy, ethoxy, phenyl, phenoxy, (C_{1-4}alkyl)carbonylamino, (C_{1-4}alkyl)-carbonyloxy, (C_{1-4}alkoxy)carbonyl or (C_{1-4}alkoxy)carbonyloxy,

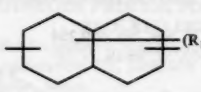
R_{13} is hydrogen, phenyl, amino, C_{1-4}alkylamino, di-(C_{1-4}alkyl)amino, C_{1-4}alkyl or C_{1-4}alkyl monosubstituted by chloro, bromo, cyano, hydroxy, methoxy, ethoxy, phenyl, phenoxy, (C_{1-4}alkyl)carbonylamino, (C_{1-4}alkyl)-carbonyloxy, (C_{1-4}alkoxy)carbonyl or (C_{1-4}alkoxy)carbonyloxy, and

X is a direct bond,









wherein R_{14} is two hydrogen, $—SO_2—$, —NH—, —O— or —S,

R_{15} is —O—, —S—, $—CH_2—$, —NH—, —CO— or $—SO_2—$,

each R_{16} is independently chloro, bromo, nitro, cyano, trifluoromethyl, methyl, methoxy, ethoxy, methoxycarbonyl or ethoxycarbonyl, and

n is 0, 1 or 2,

m is 1 or 2, and

n is 0, 1 or 2,

wherein each substituted C_{1-8}alkyl and substituted C_{1-8}alkoxy group and moiety independently has 1 or 2 substituents each of which is independently halo, cyano, hydroxy, C_{1-4}alkoxy, phenyl, phenoxy, acyl, acyloxy or acylamino,

each substituted C_{5-8}cycloalkyl and substituted C_{5-8}cycloalkyloxy group and moiety independently has 1 or 2 substituents each of which is independently C_{1-4}alkyl, halo, cyano, hydroxy, C_{1-4}alkoxy, phenyl, phenoxy, acyl, acyloxy or acylamino,

each substituted phenyl and substituted phenoxy moiety independently has 1 or 2 substituents each of which is independently nitro, C_{1-4}alkyl, halo, cyano, hydroxy, C_{1-4}alkoxy, phenyl, phenoxy, acyl, acyloxy or acylamino,

each acyl and acyl moiety of acyloxy and acylamino is independently R—Y— or R′—Z—,

wherein R is C_{1-4}alkyl; C_{1-4}alkyl substituted by 1 or 2 substituents each of which is independently halo, cyano, hydroxy, C_{1-4}alkoxy, phenyl or phenoxy; phenyl or phenyl substituted by 1 or 2 substituents each of which is independently nitro, C_{1-4}alkyl, halo, cyano, hydroxy, C_{1-4}alkoxy, phenyl or phenoxy,

Y is —O—CO—, $—SO_2—$ or $—OSO_2—$,

Z is —CO—, —NR′—CO— or —NR′—SO_2—, and

R′ is hydrogen; C_{1-4}alkyl; C_{1-4}alkyl substituted by 1 or 2 substituents each of which is independently halo, cyano, hydroxy, C_{1-4}alkoxy, phenyl or phenoxy; phenyl or phenyl substituted by 1 or 2 substituents each of which is independently nitro, C_{1-4}alkyl, halo, cyano, hydroxy, C_{1-4}alkoxy, phenyl or phenoxy, and

each halo is independently fluoro; chloro or bromo.

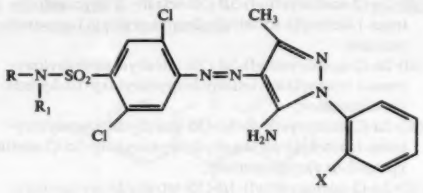
4,055,557

SULFONAMIDOBENZENE-AZO-AMINOPYRAZOLE DYESTUFFS

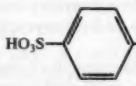
Manfred Wiesel, and Richard Sommer, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

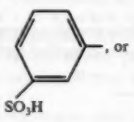
Filed Aug. 10, 1973, Ser. No. 387,315
Claims priority, application Germany, Aug. 12, 1972, 2239814
Int. Cl.[2] C09B *29/38*
U.S. Cl. 260—162 **6 Claims**

1. Dyestuff of the formula



wherein
R is





HO_3S-C_2H_4-;
R_1 is H or CH_3; and
X is H or Cl.

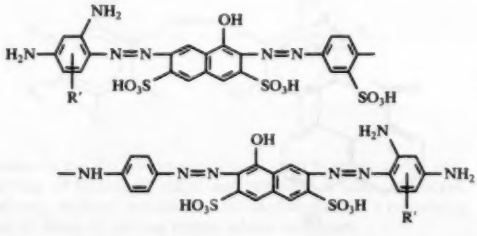
4,055,558

TETRAKISAZO DYESTUFFS

Hermann Goebel, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 14, 1972, Ser. No. 280,230
Claims priority, application Germany, Aug. 14, 1971, 2140866
Int. Cl.[2] C09B *35/36*
U.S. Cl. 260—166 **2 Claims**

1. Tetrakisazo dyestuff which in the acid form corresponds to the formula



wherein R' = H, CH_3, or NO_2.

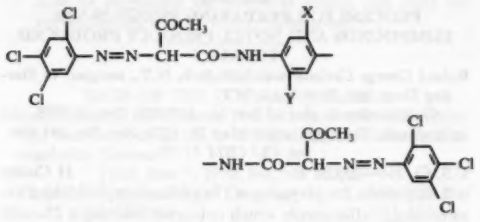
4,055,559

DISAZO PIGMENT CONTAINING AT LEAST 2 CHLORINE ATOMS AND PROCESS FOR THEIR MANUFACTURE

Georg Cseh, Arlesheim, and Willy Mueller, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 481,284, June 20, 1974, abandoned, which is a continuation of Ser. No. 287,327, Sept. 8, 1972, abandoned. This application Oct. 8, 1975, Ser. No. 620,689
Claims priority, application Switzerland, Sept. 10, 1971, 13313/71
Int. Cl.[2] C09B *33/14*
U.S. Cl. 260—176 **4 Claims**

1. A disazo pigment of the formula



wherein X and Y are hydrogen, chlorine or methyl and one of X and Y may be methoxy.

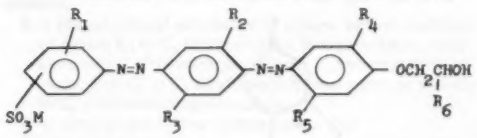
4,055,560

SULFOPHENYL-AZO-PHENYL-AZO-(4-HYDROXYALKOXYPHENYL) COMPOUNDS

Steven Arnold Dombchik, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 260,798, June 8, 1972, abandoned. This application Aug. 8, 1974, Ser. No. 495,803
Int. Cl.[2] C09B *43/00*
U.S. Cl. 260—186 **9 Claims**

1. Yellow to orange, disazo acid dye having the formula



wherein SO_3M is meta or para to the azo group, R_1 is selected from H, CH_3, OCH_3 and Cl, R_2 and R_3 are independently selected from, H, CH_3 and OCH_3, R_4 and R_5 are independently selected from H, Cl and CH_3, but only one can be Cl, R_6 is C_2H_5 and M is selected from H, alkali metal, ammonium, Cl_4 alkylammonium and Cl_2 alkanolammonium cations.

7. The dye of claim **1** wherein R_1 is ortho to the azo group and SO_3M is para to the azo group.

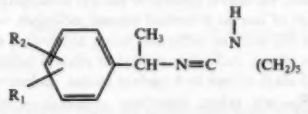
4,055,561

α-ALKYLBENZYL LACTAMIMIDES

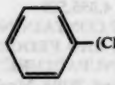
J. Martin Grisar; George P. Claxton, and Robert D. MacKenzie, all of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Apr. 25, 1973, Ser. No. 354,443
Int. Cl.[2] C07D *223/12;* A61K *31/55;* C07D *207/22, 211/72*
U.S. Cl. 260—239 B **3 Claims**

1. An α-methylbenzyl lactamimide having the formula



wherein
R_1 is phenyl, phenoxy, the group



wherein *m* is an integer of from 1 to 4, phenylalkoxy having from 2 to 4 aliphatic carbon atoms and phenoxyalkoxy having from 2 to 4 aliphatic carbon atoms;

R_2 is selected from the group consisting of hydrogen or when taken together and adjacent to the group R_1 is the cyclic radical $-(CH_2)_3-$, $-CH_2CH_2C(CH_3)_2-$, $-(CH_2)_4-$ and $-C(CH_3)_2CH_2CH_2C(CH_3)_2-$;

and the pharmaceutically acceptable acid addition salts thereof.

4,055,562

PROCESS FOR PREPARING PREGN-20-YNE COMPOUNDS AND NOVEL PRODUCT PRODUCED THEREBY

Robert George Christiansen, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 619,579, Oct. 6, 1975, abandoned. This application May 28, 1976, Ser. No. 691,196

Int. Cl.[2] C07J *71/00*

U.S. Cl. 260—239.55 R **11 Claims**

1. A process for preparing a 17α-(2-R-ethynyl-17β-hydroxysteroido[2,3-d]isoxazole which comprises reacting a 17-oxosteroido[2,3-d]isoxadole devoid of substituents, other than the 17-oxo group, reactive with organometallic compounds, with (2-R-ethynyl)magnesium halide or (2-R-ethynyl)lithium wherein R is hydrogen, methyl or trifluoromethyl.

4,055,563

CYANO INTERMEDIATES FOR PROSTAGLANDINS

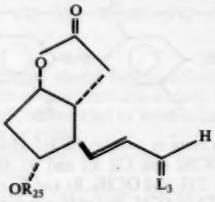
David R. White, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 566,356, April 9, 1975, Pat. No. 3,974,146. This application June 11, 1976, Ser. No. 695,147

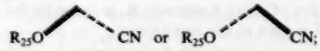
Int. Cl.[2] C07C *177/00*; C07D *307/77*

U.S. Cl. 542—413 **5 Claims**

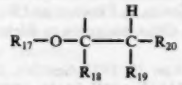
1. An optically active compound of the formula



or a mixture of that compound and the enantiomer thereof, wherein L_3 represents



and wherein R_{25} is hydrogen, 1-ethoxyethyl, tetrahydropyranyl, tetrahydrofuranyl, or a group of the formula



wherein R_{17} is alkyl of one to 17 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_{18} and R_{19} are the same or different, being hydrogen, alkyl of one to 4 carbon atoms, inclusive, phenyl or phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, or, when R_{18} and R_{19} are taken together, $-(CH_2)_a-$ or $-(CH_2)_b-O-(CH_2)_c-$ wherein a is 3, 4, or 5, b is one, 2, 3, and c is one, 2, or 3 with the proviso that b plus c is 2, 3, or 4, and wherein R_{20} is hydrogen or phenyl; with the further proviso that both R_{25}'s are the same.

4,055,564

NOVEL PROSTAGLANDIN INTERMEDIATES AND PROCESS FOR THE PRODUCTION THEREOF

Francisco S. Alvarez, Sunnyvale, and Albert R. Van Horn, Menlo Park, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 541,188, Jan. 15, 1975, Pat. No. 3,998,852, which is a division of Ser. No. 351,312, April 16, 1973, Pat. No. 3,886,185. This application Aug. 23, 1976, Ser. No. 716,727

Int. Cl.[2] C07D *7/02*; C07C *61/06*

U.S. Cl. 542—413 **9 Claims**

1. A compound selected from the group consisting of

(dl)-2α-(2-acetoxyethyl)-3β-(3S-tetrahydropyranyloxy-trans-1-octenyl)-4α-tetrahydropyranyloxy-1-oxocyclopentane.

(dl)-2α-(2-acetoxyethyl)-3β-(3S-tetrahydropyranyloxy-trans-1-octenyl)-4α-tetrahydropyranyloxy-1α-hydroxycyclopentane,

(dl)-2α-(2-acetoxyethyl)-3β-(3S-tetrahydropyranyloxy-trans-1-octenyl)-4α-tetrahydropyranyloxy-1α-(2-methoxyprop-2-oxy)cyclopentane,

(dl)-2α-(2-acetoxyethyl)-3β-(3S-tetrahydropyranyloxy-trans-1-octenyl)-4α-tetrahydropyranyloxy-1α-dimethyl-tert.-butylsilyloxycyclopentane,

2α-(2-acetoxyethyl)-3β-(3S-tetrahydropyranyloxy-trans-1-octenyl)-4α-tetrahydropyranyloxy-1-oxocyclopentane,

2α-(2-acetoxyethyl)-3β-(3S-tetrahydropyranyloxy-trans-1-octenyl)-4α-tetrahydropyranyloxy-1α-hydroxycyclopentane,

2α-(2-acetoxyethyl)-3β-(3S-tetrahydropyranyloxy-trans-1-octenyl)-4α-tetrahydropyranyloxy-1α-(2-methoxyprop-2-oxy)-cyclopentane, and

2α-(2-acetoxyethyl)-3β-(3S-tetrahydropyranyloxy-trans-1-octenyl)-4α-tetrahydropyranyloxy-1α-dimethyl-tert.-butylsilyloxycyclopentane.

4,055,565

OPTICAL BRIGHTENING AGENTS OF NAPHTHALIMIDE DERIVATIVES

Seiji Hotta, Hirakata, and Takashi Akamatsu, Ashiya, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

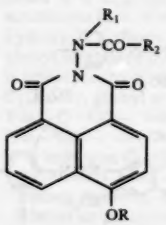
Division of Ser. No. 100,816, Dec. 22, 1970, Pat. No. 3,798,224. This application Aug. 3, 1973, Ser. No. 385,578

Claims priority, application Japan, Dec. 30, 1969, 45-1862; Dec. 30, 1969, 45-1863; Dec. 30, 1969, 45-1864; Dec. 30, 1969, 45-1865; Dec. 30, 1969, 45-1866; May 8, 1970, 45-39536; May 23, 1970, 45-44291; July 15, 1970, 45-62427; Sept. 18, 1970, 45-82103; Sept. 18, 1970, 45-82104; Nov. 6, 1970, 45-98113; Nov. 12, 1970, 45-100011; Nov. 12, 1970, 45-100012; Nov. 12, 1970, 45-100013

Int. Cl.[2] C07D *217/24*

U.S. Cl. 260—281 N **11 Claims**

1. A naphthalimide compound of the formula



wherein

R is C_1–C_6 alkyl, benzyl, C_1–C_6 alkoxy-C_1–C_6 alkyl, or phenyl;

R_1 is hydrogen, C_1–C_6 alkyl, hydroxy-C_1–C_6 alkyl or C_1–C_6 alkoxy C_1–C_6 alkyl and

R_2 is C_1–C_6 alkyl, halo-C_1–C_6 alkyl, phenyl, or C_1-C_6-alkyl- or halogen-substituted-phenyl.

4,055,566

5-SUBSTITUTED-6H[1]-BENZOPYRANO[3,2-C][1,8]NAPHTHYRIDINE-6,7-(6H)-DIONES

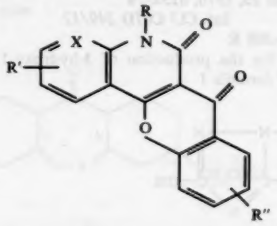
Goetz E. Hardtmann, Morristown, and Gary M. Coppola, Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 673,743, April 5, 1976, Pat. No. 4,017,499. This application Dec. 17, 1976, Ser. No. 751,797

Int. Cl.[2] C07D *491/22;* A61K *31/44*

U.S. Cl. 260—295 A **11 Claims**

1. A compound of the formula:



wherein

R is alkyl of 1 to 5 carbon atoms, alkenyl of 3 to 5 carbon atoms, alkynyl of 3 to 5 carbons, benzyl optionally mono- or disubstituted independently by fluoro, chloro or alkyl of 1 to 4 carbon atoms or cycloalkylalkyl in which the cycloalkyl is of 3 to 6 carbon atoms and the alkyl is of 1 to 3 carbon atoms, provided that the unsaturation on any alkenyl or alkynyl is other than on the alpha carbon atom,

X is N,

R′ is hydrogen, alkyl of 1 to 4 carbon atoms, fluoro, chloro, bromo or alkoxy of 1 to 4 carbon atoms when X is CH and hydrogen or alkyl of 1 to 4 carbon atoms when X is N, and

R″ is hydrogen or alkyl of 1 to 4 carbon atoms.

4,055,567

PREPARATION OF O,O′-DIHYDROXYAZOBENZENES FROM O-NITROPHENOLS

Timothy P. Murtha, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

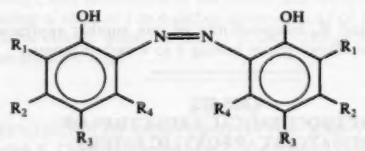
Continuation of Ser. No. 402,338, Oct. 1, 1973, abandoned. This application Mar. 8, 1976, Ser. No. 664,845

Int. Cl.[2] C09B *27/00, 43/00*

U.S. Cl. 260—206 **18 Claims**

1. A process for the preparation of an o,o′-dihydroxyazobenzene having the following formula

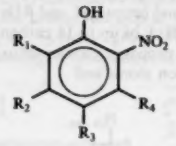
I.



wherein the R's are individually selected from the group consisting of hydrogen, alkyl, aryl, cycloalkyl, alkaryl, aralkyl, alkoxy, aryloxy, tert-amino, and alkylthio, said R's containing up to about 12 carbon atoms, which comprises

1. forming an acetal of an o-nitrophenol of the formula:

II.



wherein the R's are as earlier stated,

2. reacting said acetal with a reducing agent under such conditions that said acetal is converted to the corresponding diacetal azobenzene, and

3. then employing acid hydrolysis upon said diacetal azobenzene to regenerate the hydroxyl groups and yield the corresponding o,o′-dihydroxyazobenzene.

4,055,568

DYES OF THE COUMARIN SERIES

Manfred Patsch, and Christos Vamvakaris, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

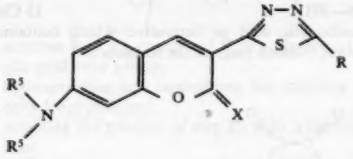
Filed June 7, 1976, Ser. No. 693,187

Claims priority, application Germany, July 2, 1975, 2529434; Nov. 27, 1975, 2553294

Int. Cl.[2] C07D *419/00*

U.S. Cl. 260—302 H **2 Claims**

1. A compound of the formula



wherein:

R is phenyl, phenyl substituted by chloro, methyl, methoxy or cyano; C_1 to C_6 alkylmercapto; benzylmercapto; tolylmercapto; chlorobenzylmercapto, hydroxyethylmercapto; β-di-C_1 to C_4 alkylaminoethylmercapto; or γ-di-C_1 to C_4 alkylaminopropylmercapto;

R^5 is alkyl of one to four carbon atoms; and

X is oxygen or imino.

4,055,569

1-BENZOTHIAZOLYL-5-ACYLOXYIMIDAZOLIDINONES

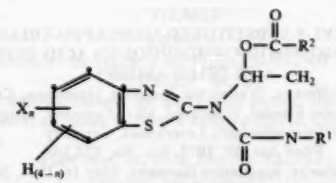
Chin Ching Wu, Libertyville, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed May 20, 1976, Ser. No. 688,447

Int. Cl.[2] C07D *417/02*

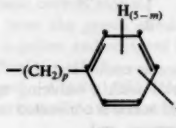
U.S. Cl. 260—305 **9 Claims**

1. A compound of the formula



wherein X is selected from the group consisting of lower alkyl, chlorine, bromine, fluorine, lower chloroalkyl, lower bromoal-

kyl, trifluoromethyl, and lower alkoxy; *n* is an integer from 0 to 2; R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and propargyl; and R^2 is selected from the group consisting of alkyl, of up to 18 carbon atoms, lower alkenyl, lower haloalkyl, propargyl, lower alkoxyalkyl, cycloalkyl of from 3 to 7 carbon atoms and



wherein *p* is an integer from 0 to 2; Y is selected from the group consisting of lower alkyl, lower alkenyl, chlorine, bromine, fluorine lower haloalkyl, lower alkoxy, lower alkylthio, nitro and cyano; and *m* is an integer from 0 to 3.

4,055,570

IMIDAZOLIDINE-4,5-DIONE DICARBOXYLIC ACIDS AND DERIVATIVES

Hans Herzog, Badenweiler; Lothar Buxbaum; Thomas Kainmüller, both of Lindenfels, Odenwald, all of Germany, and Jürgen Habermeier. Pfeffingen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 14, 1976, Ser. No. 676,850

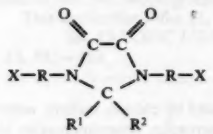
Claims priority, application Switzerland, Apr. 23, 1975, 5204/75; Feb. 12, 1976, 1708/76

Int. Cl.² C07D *233/72*

U.S. Cl. 548—301 **13 Claims**

1. A dicarboxylic acid or derivative which contains an imidazolidine-4, 5-dione ring, of the formula I

(I)



wherein

X represents nitrile, carboxyl, chlorocarbonyl, phenoxycarbonyl or alkoxycarbonyl of 1 to 10 carbon atoms in the alkoxy moiety,

R represents alkylene of 1 or 2 carbon atoms in the chain, said alkylene substituted with alkyl groups of 1 to 6 carbon atoms, cyclohexylene, phenylene or benzylene the methyl group of which is attached to the nitrogen atom, each of R^1 and R^2 independently represents hydrogen, alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 8 ring members, phenyl, or together R^1 and R^2 represent tetramethylene, pentamethylene, hexamethylene or heptamethylene, with the proviso that, if R represents phenylene, R^1 is a hydrogen atom and R^2 is alkyl of 1 to 18 carbon atoms or cycloalkyl of 5 to 8 ring members.

4,055,571

O-[1-ALKYL-5-SUBSTITUTED-MERCAPTO-TRIAZOL(-3)YL]-PHOSPHORIC(PHOSPHONIC) ACID ESTERS AND ESTER-AMIDES

Hellmut Hoffmann, Wuppertal; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

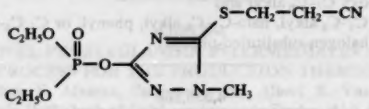
Filed Apr. 30, 1975, Ser. No. 573,203

Claims priority, application Germany, May 16, 1974, 2423765

Int. Cl.² C07D *249/12*

U.S. Cl. 260—308 R **1 Claim**

1. The compound O,O-diethyl-O-[1-methyl-5-(2'-cyanoethyl)-mercapto-triazol(3)yl]-phosphoric acid ester of the formula



4,055,572

PROCESS FOR THE PRODUCTION OF 3-HYDROXY-1,2,4-TRIAZOLE DERIVATIVES

Dag Dawes, Voyenenga, Norway, Rudolph C. Thummel, Courgenay, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 20, 1976, Ser. No. 707,148

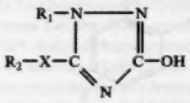
Claims priority, application Switzerland, Aug. 6, 1975, 10241/75; June 25, 1976, 8152/76

Int. Cl.² C07D *249/12*

U.S. Cl. 260—308 R **6 Claims**

1. Process for the production of 3-hydroxy-1,2,4-triazole derivatives of formula I

(I)



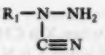
wherein

R_1 and R_2 each represent a straight-chain or branched-chain alkyl group having 1 to 6 carbon atoms, or a cycloalkyl group having 3 to 6 carbon atoms, and

X represents oxygen or sulphur,

which process comprises reacting a 1-alkyl-1-cyanohydrazine of formula II

(II)



wherein R_1 has the meaning given under formula I, in an inert solvent in the presence of a base at a temperature of 0° - 250° C. with a compound of formula III

$$R_2 - XH \qquad \text{(III)}$$

wherein R_2 and X have the meanings given under formula I; and subsequently cyclising the reaction product at a temperature of 20° - 100° C. in the presence of a base by reaction with a compound of formula IV

(IV)

wherein R_3 and R_4 independently of one another represent chlorine or an alkoxy group having 1 to 4 carbon atoms.

4,055,573

ELECTROCHEMICAL REDUCTION OF IMIDAZOLECARBOXYLIC ESTERS

Wilford Lee Mendelson, Philadelphia, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Filed May 6, 1976, Ser. No. 683,863

Int. Cl.² C07D *233/64*; C25B *3/09*

U.S. Cl. 548—335 **10 Claims**

7. The method of preparing 4-(2-aminoethylthiomethyl)-5-

methylimidazole comprising electrochemical reduction in a divided cell of a lower alkyl 5-methyl-4-imidazolecarboxylate in 25% sulfuric acid with a mercury or lead cathode at about 40°–75° C. in a concentration chosen from within the range of from 1 M. up to the upper limit of solubility to give a mixture of 5-methyl-4-hydroxymethylimidazole and 5-methyl-4-lower-alkyloxymethylimidazole then reacting said mixture with cysteamine.

4,055,574

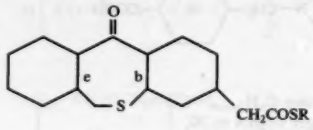
6,11-DIHYDRODIBENZO-[B.E.]-THIEPIN-11-ONE-3-THIOACETATES

Jack Ackrell, Palo Alto, Calif., and Joseph M. Muchowski, Mexico City, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

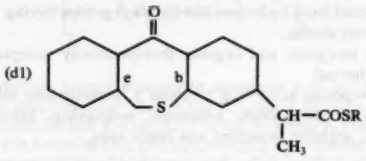
Filed July 1, 1976, Ser. No. 701,779
Int. Cl.² C07D 337/12
U.S. Cl. 260—327 B **18 Claims**

1. A compound selected from the group of those represented by the formulas

(A)

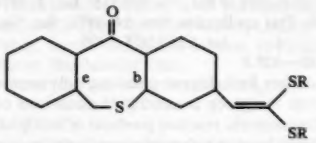


(B)



or the individual (d) isomers of the compounds of Formula (B), wherein R is a lower alkyl group of one to six carbon atoms, phenyl, monosubstituted phenyl, benzyl or monosubstituted benzyl, said substitution in the phenyl and benzyl groups consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chloro, bromo or fluoro, at the o-, m- or p-positions of the aromatic ring.

17. A compound of the formula



wherein R is a lower alkyl group of one to six carbon atoms, phenyl, monosubstituted phenyl, benzyl, or monosubstituted benzyl, said substitution in the phenyl and benzyl groups consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, chloro, bromo or fluoro, at the o-, m- or p-positions of the aromatic ring.

4,055,575

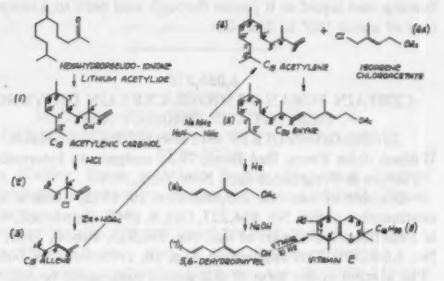
SYNTHESIS OF DEHYDROPHYTOL AND VITAMIN E

Ralph E. Close, Jacksonville, Fla., and William Oroshnik, Plainfield, N.J., assignors to SCM Corporation, New York, N.Y.

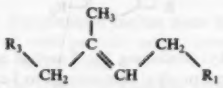
Filed Mar. 20, 1975, Ser. No. 560,550
Int. Cl.² C07D 311/72
U.S. Cl. 260—345.5 **7 Claims**

1. A process for the synthesis of dehydro-Vitamin E comprising the steps of

a. reacting hexahydropseudo-ionone with a metal acetylide to form 3,7,11-trimethyl-3-hydroxy-1-dodecyne;
b. reacting the product of step a) with a reagent capable of replacing the hydroxyl group with a halogen to produce 3,7,11-trimethyl-3-halo-1-dodecyne;



c. reducing the product of step b) to form the corresponding allene, said allene being 3,7,11-trimethyldodeca-1,2-diene;
d. isomerizing the allene of step c) to 3,7,11-trimethyldodeca-1-yne in the presence of a strong base;
e. coupling the acetylene of paragraph d) with a reactant having the general formula



wherein R_3 is a halogen and R_1 is an hydroxyl or carboxylic acid ester group;
f. hydrogenating and saponifying the coupling product to dehydrophytol; and
g. coupling the product of step (f) with trimethylhydroquinone.

4,055,576

PROCESS FOR THE PREPARATION OF TERPENE-MALEIC ANHYDRIDES CONTAINING LESS THAN 15% DI-ADDUCT

Robert William Schluenz, and Curry Beach Davis, both of Panama City, Fla., assignors to Arizona Chemical Company, Wayne, N.J.

Filed Apr. 19, 1976, Ser. No. 678,083
Int. Cl.² C07D 307/89
U.S. Cl. 260—346.6 **7 Claims**

1. A process for preparing maleic anhydride adducts from non-conjugated monocyclic terpenes which comprises: reacting at temperatures between 175° C. and 200° C. substantially equimolar amounts of (a) a non-conjugated monocyclic terpene or mixed non-conjugated monocyclic terpenes and (b) maleic acid anhydride in the presence of from 0.05% to 0.15% iodine, based on the weight of the terpene, and recovering a mixture of not less than 85% mono-adduct and not more than 15% di-adduct of terpene maleic adduct in good yield, color and purity.

4,055,577

PROCESS FOR THERMAL TREATMENT OF CRUDE PHTHALIC ACID

Helmut Saffran, Dansweiler, and Lothar Sterck, Hurth, both of Germany, assignors to Davy Powergas GmbH, Cologne, Germany

Filed Nov. 11, 1974, Ser. No. 522,913
Int. Cl.² C07D 307/89
U.S. Cl. 260—346.7 **17 Claims**

1. A process for the thermal treatment of crude liquid phthalic anhydride to enhance purification of said liquid which

comprises passing said liquid through a portion of a thermal treating path, passing said liquid from said portion through another portion of said path, one of said portions being positioned substantially completely around said other portion and in adjacent, indirect heat exchange relationship therewith, and heating said liquid as it passes through said path to a temperature of about 190° to 285° C.

4,055,578

CERTAIN FURAN-3-THIOLS, CERTAIN DIHYDRO DERIVATIVES THEREOF AND 2,5-DIMETHYLTETRAHYDROFURAN-3-THIOL

William John Evers, Red Bank, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

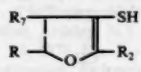
Division of Ser. No. 295,859, Oct. 10, 1972, which is a continuation of Ser. No. 864,227, Oct. 6, 1969, abandoned, which is a continuation-in-part of Ser. No. 796,923, Feb. 5, 1969, Pat. No. 3,666,495. This application Aug. 18, 1975, Ser. No. 605,393

The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.

Int. Cl.² C07D *307/64, 307/38*

U.S. Cl. 260—347.2 **10 Claims**

1. A furanthiol having the formula



wherein R_2 is alkyl containing 2 to 5 carbon atoms, each of R_3 and R_7 is hydrogen or alkyl containing 1 to 5 carbon atoms and the dashed line represents a single or double carbon-to-carbon bond.

4,055,579

PROCESS FOR THE PRODUCTION OF ETHYLENE OXIDE

Gioacchino Cocuzza, Catania; Italo Montoro, Como, and Benedetto Calcagno, Milan, all of Italy, assignors to Societa' Italina Resine S.I.R. S.p.A., Milan, Italy

Filed Nov. 29, 1973, Ser. No. 420,343

Claims priority, application Italy, Nov. 30, 1972, 32274/72

Int. Cl.² C07D *301/10*

U.S. Cl. 260—348.34 **16 Claims**

1. Process for the production of ethylene oxide by catalytic oxidation of a gas stream containing ethylene and oxygen in the presence of a silver-based catalyst, characterized in that:

a first reaction zone containing the silver-based catalyst is supplied with a gas stream containing about 5 to 25% by volume of ethylene, about 2 to 10% by volume of oxygen and about 0.1 to 20 ppm of a moderator for the reaction, the zone being kept at a temperature of about 220° to 350° C and at a pressure from atmospheric pressure to about 30 kg/cm² and the contact times being from about 1 to 6 seconds wherein the conversion in the first zone is limited so that the content of ethylene oxide in the outgoing gas stream does not exceed about 1.5% by volume;

the gas stream from the first zone, containing at least about 0.9% by volume of ethylene oxide, is cooled to about 220° to 270° C and (is added with) oxygen or a gas containing molecular oxygen and the moderator for the reaction are added thereto in such amounts that the concentrations of the aforementioned substances are restored to approximately their respective levels present before entering the first zone and therefore are respectively from about 2 to 10% by volume and from about 0.1 to 20 ppm;

the resulting gas stream is supplied to a second reaction zone containing the silver-based catalyst and the contact times in the second zone are from about 1 to 6 seconds, the pressure is from atmospheric pressure to about 30 kg/cm² and the temperature is from about 200° to 300° C, the reaction temperature of the second zone being at least 5° C less than the temperature of the first zone; and

ethylene oxide leaving the second reaction zone is recovered and the residual gases are recycled to the first zone after removing the carbon dioxide which they contain.

4,055,580

DERIVATIVES OF AMINOMETHYLCYCLOHEXANECARBOXYLIC ACID

Aldo Bertelli, Milan, Italy, assignor to Rorer Italiana S.p.A., Milan, Italy

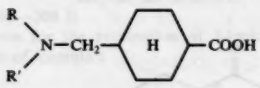
Filed Aug. 22, 1975, Ser. No. 607,041

Int. Cl.² C11C *3/00*; C07F *3/00*; C07C *61/01, 101/00*

U.S. Cl. 260—404.5 **10 Claims**

1. A compound selected from the compounds of general formula:

(I)



in which:

R is in a group $C_nH_{2n+n'}$—CO—;

n is an integer from 4 to 20,

n' is selected from +1, −1, −3 and −5, and

R is selected from hydrogen and the alkyl groups having 1 to 6 carbon atoms,

and the inorganic and organic therapeutically acceptable salts thereof.

2. A compound according to claim **1**, wherein said salt is selected from the sodium, potassium, magnesium, calcium, aluminium, arginine, ornithine and lysine salts.

4,055,581

HEAT AND LIGHT STABILIZERS FOR HALOGEN CONTAINING POLYMERIC RESINS

George C. Hopkins, Clarence, N.Y., and D. Bruce Merrifield, Houston, Tex., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

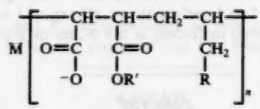
Continuation-in-part of Ser. No. 430,115, Jan. 2, 1974, Pat. No. 3,933,740. This application Nov. 14, 1975, Ser. No. 631,967

Int. Cl.² C07F *3/06*

U.S. Cl. 260—429.9 **9 Claims**

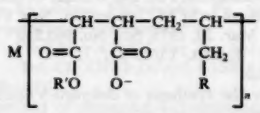
1. As stabilizer for halogen-containing polymers, a metal salt selected from the group consisting of metal salts of the polymeric and monomeric reaction products of an alpha olefin and maleic anhydride, said polymeric metal salt having recurring units of the formula:

(A)

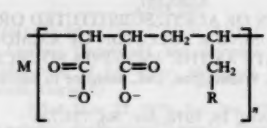


or

(B)

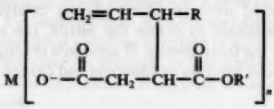


or



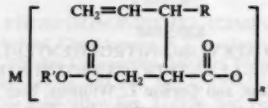
and said metal monomeric salt being represented by the formula:

(D)



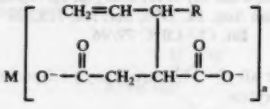
or

(E)



or

(F)



or mixtures thereof wherein M represents a di- or tetravalent metal selected from the group consisting of calcium, zinc, cadmium, barium and tin; n is 1 or 2 in formulas (C) and (F) and 2 or 4 in formulas (A), (B), (D), and (E); R is selected from the group consisting of hydrogen, aryl, alkyl, aralkyl, alkaryl and substituted derivatives thereof having 1 to 17 carbon atoms which can be halogenated, and R' is selected from the group consisting of alkali metal cations, ammonium cation, lower alkyl-substituted ammonium cations, hydrogen atom, aryl groups, alkyl groups, aralkyl groups, alkaryl groups and substituted derivatives of said groups having 1 to 17 carbon atoms which can be halogenated.

4,055,582

SYNTHESIS OF NICKEL AND PALLADIUM ORGANOPHOSPHORUS COMPLEXES

Darryl R. Fahey, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 10, 1976, Ser. No. 684,986
Int. Cl.[2] C07F *15/04, 15/00*
U.S. Cl. 260—439 R **26 Claims**

1. A process comprising reacting at least one compound of the formula $RMX(PR_3)_2$ with at least one compound of the formula APR_2 in the presence of a diluent under reaction conditions sufficient to produce at least one composition which can be represented by the formula $M(PQ_3)_n$, wherein M is palladium or nickel; X is a halogen; A is an alkali metal; each R is individually selected from the group consisting of suitable aliphatic hydrocarbyl radicals, halosubstituted aliphatic hydrocarbyl radicals, aromatic hydrocarbyl radicals wherein at least one carbon adjacent the radical carbon has a hydrogen substituent, halosubstituted aromatic hydrocarbyl radicals wherein at least one carbon adjacent the radical carbon has a hydrogen substituent, hydrocarbyloxy radicals, and halosubstituted hydrocarbyloxy radicals, each Q is individually selected from any R contained in the reactants; each PR_3 may be the same or different; each PQ_3 may be the same or different; the molar ratio of each different PQ_3 to M can be any rational number such that the sum of the molar ratios of the different PQ_3's equals *n;* and *n* equals 3 when M is palladium or 4 when M is nickel.

26. A composition of matter having the average formula of $Pd(PEt_3)_{1.9}(PPh_3)_{1.1}$ wherein PEt_3 is triethylphosphine and PPh_3 is triphenylphosphine.

4,055,583

METHOD FOR THE PRODUCTION OF CARBONACEOUS ARTICLES, PARTICULARLY STRANDS

Georg Kölling, Essen, and Ingo Romey, Drevenack, both of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Division of Ser. No. 570,458, April 22, 1975, Pat. No. 3,997,654. This application June 15, 1976, Ser. No. 696,296
Claims priority, application Germany, Apr. 24, 1974, 2419659
Int. Cl.[2] D01F *9/12*
U.S. Cl. 423—447.4 **8 Claims**

1. A method for producing carbonaceous articles in the form of fibers or strands comprising

a. heating pitch having a Kramer-Sarnow softening point between about 70° and 190° C to a temperature about 40° to 100° C above its softening point so that part of the pitch is molten;

b. filtering the thus-obtained molten mass so as to remove substantially all solid particles and to increase the homogeneity of the molten mass;

c. then cooling the remaining mass and grinding it to small particles followed by contacting the particles with an aliphatic solvent adapted to dissolve a portion of the said particles;

d. removing at least the major part of the solvent;

e. passing the remaining aliphatic solvent-insoluble portion of the mass under application of heat and pressure through a forming head so as to shape it to fibers, strands or threads;

f. sprinkling the fibers or strands with finely ground activated carbon which has been impregnated with a liquid oxidizing agent;

g. then heating the thus-treated fiber strands or fibers to about 350° C to improve their melt-resistance, and

h. finally carbonizing the strands or fibers at a temperature of about 1000° C.

4,055,584

PROCESS FOR THE PRODUCTION OF BETA-CHLOROETHYLTRICHLOROSILANE

Hermann Kny, Fullinsdorf, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 10, 1976, Ser. No. 722,858
Int. Cl.[2] C07F *7/08, 7/12*
U.S. Cl. 260—448.2 E **4 Claims**

1. In a process for the production of β-chloroethyltrichlorosilane by reacting hydrogen chloride with vinyl trichlorosilane in the presence of aluminium chloride at elevated pressure at temperature between 0° and 90° C, the improvement which comprises using the aluminium chloride which remains in the reaction vessel after separating off the β-chloroethyltrichlorosilane by distillation, and which still contains β-chloroethyltrichlorosilane, directly in the next reaction, provided that β-chloroethyltrichlorosilane is distilled off after each reaction in such an amount that the residue constitutes a still stirrable broth.

4,055,585

PREPARATION OF LIQUID TDI FOR COMPOSITIONS

Masahiro Okamoto; Makoto Nemoto, both of Kanagawa; Yushin Kataoka, Ehime, and Yoshiharu Tokugawa, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Nittetsu Chemical Industrial Co., Ltd., Tokyo, both of, Japan

Division of Ser. No. 470,098, May 15, 1974, Pat. No. 4,000,099. This application Apr. 26, 1976, Ser. No. 680,391

Int. Cl.[2] C07C *118/02, 119/048*

U.S. Cl. 260—453 SP 3 Claims

1. A process for forming a liquid of a solid toluene diisocyanate tar by-product in the preparation of toluene diisocyanate, which comprises

1.

1-1. heating the toluene diisocyanate tar having a softening point of about 200° C or higher, at a temperature above the softening point of said toluene diisocyanate tar, or

1-2. withdrawing the toluene diisocyanate tar having a softening point of about 200° C or higher, in a molten condition from the toluene diisocyanate producing apparatus,

and then the molten toluene diisocyanate tar at a temperature above the softening point of said toluene diisocyanate tar in a substantially anhydrous condition with an aromatic solvent selected from the group consisting of creosote oil, anthracene oil, pitch oil, methyl naphthalene oil, crystal-freed naphthalene oil, absorbing oil, washing oil, and hydrogenated cracked gasoline having a boiling point of above 200° C, to form a solution of said toluene diisocyanate tar,

2. pulverizing the above-define toluene diisocyanate tar at a temperature below the softening point thereof to a stirrable size, and

2-1. mixing the pulverized toluene diisocyanate tar at a temperature below the softening point thereof in a substantially anhydrous condition with the above-defined aromatic solvent to form a dispersion of said toluene diisocyanate tar, and then maintaining the temperature of the dispersion at a temperature above the softening point thereof for at least 5 minutes to form a solution of said toluene diisocyanate tar, or

2-2. mixing the pulverized toluene diisocyanate tar at a temperature above the softening point thereof in a substantially anhydrous condition with the above defined aromatic solvent to form a solution of the toluene diisocyanate tar, or

3. pulverizing the above-defined toluene diisocyanate tar at a temperature below the softening point thereof in a substantially anhydrous condition in the above-defined aromatic solvent to form a dispersion of said toluene diisocyanate tar.

4,055,586

PROCESS FOR THE MANUFACTURE OF BIS-(2-CYANOETHYL)-AMINE

Hans Feichtinger, Dinslaken; Wolfgang Payer, Wesel; Boy Cornils, Dinslaken, and Jürgen Weber, Oberhausen, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany

Filed Oct. 20, 1976, Ser. No. 733,999

Claims priority, application Germany, Oct. 27, 1975, 2547977

Int. Cl.[2] C07C *120/00, 121/43*

U.S. Cl. 260—465.5 R 5 Claims

1. A process for the manufacture of bis-(2-cyanoethyl)-amine which comprises reacting gaseous ammonia with acrylonitrile having a 5–15% by weight water content in a bubble column reactor.

4,055,587

AMMOXIDATION OF ALKYL SUBSTITUTED ORGANIC COMPOUNDS USING A SOLUTION OF AMMONIUM CARBONATE AS THE AMMONIA SOURCE

Richard V. Norton, Wilmington, Del., assignor to Suntech, Inc., St. Davids, Pa.

Filed Aug. 16, 1976, Ser. No. 714,730

Int. Cl.[2] C07C *120/14*

U.S. Cl. 260—465 C 9 Claims

1. In the process of converting an alkyl-substituted hydrocarbon of the benzene or naphthalene series to a nitrile by ammoxidation where the hydrocarbon reactant, oxygen and ammonia are reacted over an ammoxidation catalyst under ammoxidation conditions to obtain the nitrile, the improvement of supplying the total amount of ammonia reactant to the reactor as an aqueous solution of ammonia and carbon dioxide.

4,055,588

TETRA-(LOWER-ALKYL)3-(3-NITROPHENYL)-1,5-PENTANEDIONE-1,2,4,5-TETRACARBOXYLATES

Philip M. Carabateas, and Gordon L. Williams, both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 659,695, Feb. 20, 1976, which is a division of Ser. No. 588,380, June 19, 1975, Pat. No. 3,970,662. This application Aug. 18, 1976, Ser. No. 715,329

Int. Cl.[2] C07C *79/46*

U.S. Cl. 560—23 2 Claims

1. Tetra-(lower-alkyl) 3-(3-nitrophenyl)-1,5-pentanedione-1,2,4,5-tetracarboxylate.

4,055,589

20-ALKOXY-16-ALKYL PROSTADIENOIC ACID DERIVATIVES

Noriyoshi Inukai; Masuo Murakami, both of Tokyo; Hidenori Iwamoto, Ageo; Isao Yanagisawa; Toshinari Tamura, both of Tokyo; Yoshio Ishii, Omiya; Kenichi Tomioka, Kitamoto, all of Japan, and Tetsuya Shiozaki, deceased, late of Misato, Japan (by Hiroko Shiozaki, legal representative), assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

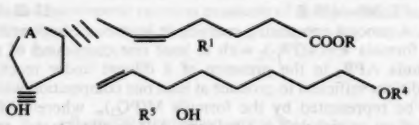
Filed Dec. 15, 1975, Ser. No. 640,497

Claims priority, application Japan, Dec. 20, 1974, 49-145617; Nov. 4, 1975, 50-132295

Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—121 4 Claims

1. A 20-alkoxy-16-alkylprostadienoic acid derivative shown by the formula



wherein A represents

R and R^5, which may be the same or different, each represents a hydrogen atom or a lower alkyl group, and R^1 and R^4, which may be the same or different, each represents a lower alkyl group

and the pharmacollogically acceptable nontoxic salts thereof.

4,055,590

METHOD OF MAKING CARBOXYLIC ACID ESTERS

Wilhelm Gruber, Darmstadt, and Guenter Schroeder, Ober-Ramstadt, both of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed June 22, 1976, Ser. No. 698,676
Claims priority, application Germany, June 26, 1975, 2528524
Int. Cl.[2] C07C *69/66*
U.S. Cl. 560—179 5 Claims

1. In a method for making a carboxylic acid ester by the reaction of the corresponding carboxylic acid amide with a primary alcohol in the presence of a catalyst at elevated temperature, the improvement wherein said catalyst is an at least partially dissolved metal carboxylate or a compound forming a metal carboxylate by reaction in situ with a carboxylic acid, the anion of which metal carboxylate is the anion of said carboxylic acid.

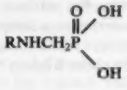
4,055,591

PHOSPHONOMETHYL COMPOUNDS

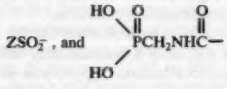
Daniel J. Scharf, Cheektowaga, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Division of Ser. No. 431,195, Jan. 7, 1974, Pat. No. 3,939,226.
This application Jan. 2, 1976, Ser. No. 646,218
Int. Cl.[2] C07F *9/38*; C07C *143/86*
U.S. Cl. 260—502.5 4 Claims

1. A compound of the formula



wherein R is selected from the group consisting of



wherein Z is selected from the group consisting of OH, alkyl, aryl, alkoxy, and aryloxy.

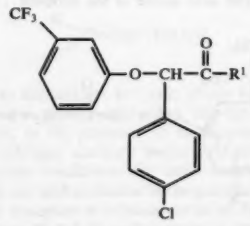
4,055,592

N-(SULFO-LOWER ALKYL) AMIDES OF (3-TRIFLUOROMETHYLPHENOXY) (4-CHLOROPHENYL)ACETIC ACID

William A. Bolhofer, Frederick, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 501,717, Aug. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 309,569, Nov. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 232,966, March 8, 1972, Pat. No. 3,787,423. This application Feb. 13, 1976, Ser. No. 657,813
Int. Cl.[2] A61K *31/185*; C07C *143/52*
U.S. Cl. 260—507 R 3 Claims

1. A compound of the formula:



wherein R^1 is sulfo-lower alkyl amino or the non-toxic, pharmacologically acceptable alkali metal salts.

4,055,593

ALKYL DIETHERS OF PROSTAGLANDINS

Ned M. Weinshenker, Sunnyvale, Calif., and Niels H. Andersen, Seattle, Wash., assignors to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 117,166, Feb. 19, 1971, abandoned.
This application Apr. 23, 1975, Ser. No. 570,621
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—514 D 2 Claims

1. A 11α,15(S)-bis(lower dialkyl' lower alkoxy' methyloxy)-9-oxo-5-cis,13-trans-prostadienoic acid wherein the lower alkyl group is from 1 to 8 carbon atoms and the lower alkoxy is from 1 to 8 carbon atoms.

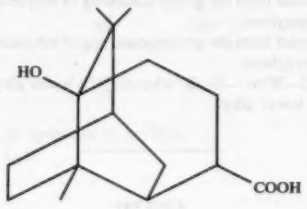
4,055,594

INTERMEDIATES USEFUL FOR THE PRODUCTION OF NORPATCHOULENOL

Paul José Teisseire, Grasse, France, assignor to Societe Anonyme Roure Bertrand Dupont, Paris, France

Filed July 9, 1975, Ser. No. 594,335
Claims priority, application Switzerland, Apr. 9, 1975, 10676/75
Int. Cl.[2] C07C *61/32*
U.S. Cl. 260—514 G 1 Claim

1. A compound of the formula



4,055,595

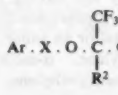
SUBSTITUTED ARYLOXY-3,3,3-TRIFLUORO-2-PROPIONIC ACIDS, ESTERS AND SALTS THEREOF

David Bryan Haydock; Thomas Patrick Cunningham Mulholland, and Jeffrey Meyrick Thorp, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 10, 1975, Ser. No. 630,685
Claims priority, application United Kingdom, Dec. 6, 1974, 52829/74
Int. Cl.[2] C07C *65/14*, *65/02*, *69/76*
U.S. Cl. 260—520 B 8 Claims

1. A fluorinated compound of the formula:-

I



wherein Ar is a phenyl or naphthyl radical which, may optionally bear as substituent a halogen atom, an alkyl radical of 1–4 carbon atoms or an alkoxy radical of 1–4 carbon atoms, or a phenyl or phenoxy radical which may itself bear as substituent a halogen atom, an alkyl radical or 1–4 carbon atoms or an alkoxy radical of 1–4 carbon atoms; X is $—CH_2—$; R^1 is a hydroxy radical or an alkoxy radical of 1–6 carbon atoms; and R^2 is a hydrogen atom, a methyl radical or a trifluoromethyl

radical; or, for a compound wherein R^1 is a hydroxy radical, a pharmaceutically acceptable base addition salt thereof.

4,055,596

11,12-SECO-PROSTAGLANDINS

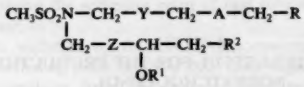
Edward J. Cragoe, Jr., Lansdale, and James H. Jones, Blue Bell, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 505,445, Sept. 13, 1974, Pat. No. 3,991,106. This application July 14, 1976, Ser. No. 704,859

Int. Cl.² C07C *143/822*

U.S. Cl. 260—534 M **7 Claims**

1. The compound of the formula



wherein

R is selected from the group consisting of carboxy and a carboxy salt, said carboxy salt being formed from a pharmaceutically acceptable cation, and alkoxycarbonyl of the formula —COOAlk wherein Alk is alkyl having 1–10 carbon atoms; p1 R^1 is hydrogen or lower alkanoyl;

A is selected from the group consisting of methylene or oxygen;

Y is selected from the group consisting of ethylene, vinylene, or ethynylene;

Z is selected from the group consisting of ethylene, vinylene, or ethynylene;

R^2 is —O—R^5 or —S—R^5 wherein R^5 is lower alkyl or fluorinated lower alkyl.

4,055,597

10-AZA-11,12-SECOPROSTAGLANDINS

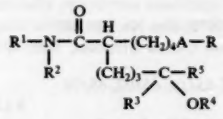
Edward J. Cragoe, Jr., and John B. Bicking, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 326,934, Jan., 1973, abandoned. This application June 2, 1975, Ser. No. 583,075

Int. Cl.² C07C *101/00*

U.S. Cl. 260—534 M **14 Claims**

1. The compound having the following formula:



wherein

R is carboxy or a carboxy salt having the formula —COO^-Me^+ wherein Me is a pharmaceutically-acceptable cation derived from a metal or an amine;

A is ethylene, trimethylene, α-methylethylene, β-methylethylene, α,α-dimethylethylene, or β,β-dimethylethylene;

R^1 is hydrogen or methyl;

R^2 is hydrogen or alkyl or 1–3 carbon atoms;

R^3 is hydrogen or methyl;

R^4 is hydrogen; and

R^5 is loweralkyl of 3–7 carbon atoms, 4-pentenyl, or 5,5,5-trifluoropentyl; except that when R^3 is methyl, R^5 is limited to propyl, butyl, pentyl, 4-methylpentyl, 4,4-dimethylpentyl, hexyl, heptyl, and 5,5,5-trifluoropentyl.

4,055,598

PROCESS FOR PREPARATION OF UREA AUTOCONDENSATION PRODUCT

John M. Lee, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 242,220, April 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 865,211, Oct. 9, 1969, abandoned. This application Apr. 14, 1975, Ser. No. 568,095

Int. Cl.² C07C *127/24*

U.S. Cl. 260—553 B **5 Claims**

1. A process in which urea is pyrolytically converted to biuret, said process consisting of

dispersing, with agitation in an inert hydrocarbon carrier, a seed material consisting of a urea pyrolyzate product essentially containing less than about 15 weight percent urea, about 60 to about 85 weight percent of biuret, and minor amounts of other urea condensation products,

adding to the so-dispersed seed material, with agitation, a feedstock material consisting of a urea pyrolyzate product essentially containing about 35 weight percent or more or urea, a biuret content of up to about 55 weight percent, and minor amounts of other urea condensation products,

wherein the feedstock material is added in an amount that the total urea content of the combined seed and feedstock does not exceed 20 weight percent,

the ratio of the combined seed and feedstock to hydrocarbon carrier being in the range of about 5:95 to about 60:40 by weight,

heating, with agitation, the mixture of seed and feedstock dispersed in said carrier at a temperature in the range of about 100° C to about 150° C for a period of time of from about 10 minutes to about 8 hours to cause pyrolysis of the urea,

and recovering from said carrier a urea pyrolyzate product containing less than about 15 weight percent urea, 60 to about 85 weight percent biuret, and minor amounts of other urea condensation products,

wherein the said inert hydrocarbon carrier is substantially a non-solvent for, and is substantially inert to, ammonia, urea and autocondensation pyrolysis products of urea, said carrier comprising at least one of those compounds selected from the group consisting of saturated branched-chain and straight-chain hydrocarbons of the alkane series having from 8 to 12 carbon atoms.

4,055,599

N-(ALKYLHYDROBENZYL)-ALKYLTHIO- AND MERCAPTO-ACETAMIDES

Helmut Huber-Emden; Karl Eschle, both of Basel, and Arthur Maeder, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

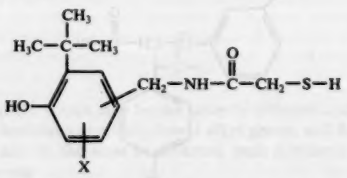
Continuation-in-part of Ser. No. 69,886, Sept. 4, 1970, Pat. No. 3,927,091, which is a continuation-in-part of Ser. No. 737,832, June 18, 1968, abandoned. This application Sept. 8, 1975, Ser. No. 611,043

Claims priority, application Switzerland, June 23, 1967, 8947/67

Int. Cl.² C07C *103/38*

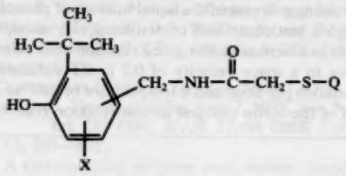
U.S. Cl. 260—562 S **6 Claims**

1. A carboxylic acid amide of the formula



in which X is methyl or tertiary butyl.

3. A carboxylic acid amide of the formula



in which X is methyl or tertiary butyl and Q is alkyl containing 1 to 20 carbon atoms.

4,055,600
CYCLOHEXANE OXIDATION PROCESS

Philip Edward Langley, and Robert Tulip, both of Middlesbrough, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 6, 1975, Ser. No. 629,554

Claims priority, application United Kingdom, Nov. 21, 1974, 50443/74

Int. Cl.[2] C07C *27/12, 29/00, 45/02, 179/02*

U.S. Cl. 260—586 P **8 Claims**

1. In a process for the oxidation of cyclohexane wherein the liquid cyclohexane and a gas containing molecular oxygen are continuously fed to a reactor operating at elevated temperature under pressure and wherein the liquid cyclohexane in absence of catalyst is converted to the extent of less than 5% to an oxidation product consisting essentially of cyclohexylhydroperoxide, cyclohexanol and cyclohexanone, and a liquid mixture of cyclohexane and the said oxidation product is continuously removed from the reactor, the improvement consisting essentially of conducting the oxidation in a two compartment reactor, the two compartments contacting each other to allow heat transfer between them, and releasing the entire reaction mixture in the first compartment in which the degree of conversion of cyclohexane is from 2 to 4% directly from the first compartment at a pressure in the range 8 to 50 bar absolute and a temperature in the range 150° to 200° C to the second compartment operating at a lower pressure in the range 2 to 5 bar absolute and a lower temperature in the range 115° to 140° C, whereby part of the cyclohexane is vaporized, and a liquid mixture of cyclohexane and oxidation product containing from 5 to 15% of oxidation product is continuously removed from the reactor.

4,055,601
PROCESS FOR THE OXIDATION OF PRIMARY ALLYLIC ALCOHOLS

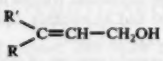
William J. Ehmann, Orange Park, Fla., assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 437,188, Jan. 28, 1974, abandoned. This application May 30, 1975, Ser. No. 582,114

Int. Cl.[2] C07C *45/16*

U.S. Cl. 260—593 R **13 Claims**

1. In an Oppenauer oxidation for converting a 3-substituted or 3,3-disubstituted allyl alcohol having the following configuration



wherein R is an aliphatic or aromatic group and R′ is hydrogen, an aliphatic or an aromatic group, into the corresponding olefin aldehyde, in the presence of an Oppenauer oxidation catalyst and hydrogen acceptor under mild temperature Oppenauer oxidation conditions, the improvement which comprises carrying out said oxidation in the presence of furfural as said hydrogen acceptor in a molar ratio of furfural to allyl alcohol of about 10:1–1:10 and forming a reaction product mixture containing the aldehyde corresponding to the allyl alcohol and as a by-product, furfuryl alcohol, said catalyst being employed in a catalytic amount.

3. The oxidation process of claim 1 wherein said allyl alcohol is disubstituted with aliphatic groups.

4,055,602
2-DECARBOXY-2-HYDROXY-METHYL-5-OXA-17-PHENYL-18,19,20-TRINOR-PGF-ANALOGS

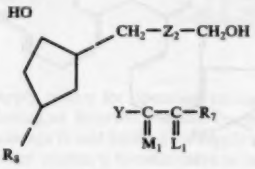
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 8, 1976, Ser. No. 647,357

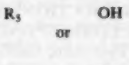
Int. Cl.[2] C07C *43/20*

U.S. Cl. 250—613 D **39 Claims**

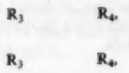
1. A prostaglandin analog of the formula



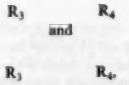
wherein R_8 is hydrogen or hydroxy;
wherein Y is trans—CH=CH—;
wherein M_1 is



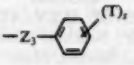
wherein R_5 is hydrogen or methyl:
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein Z_2 is
$—CH_2—O—(CH_2)_g—CH_2—$;
where g is one, 2, or 3; and
wherein R_7 is



wherein Z_3 is methylene, s is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the provisio that not more than two T's are other than alkyl.

4,055,603

ALKINYL TERMINATING GROUPS IN BIOGENETIC-LIKE CYCLIZATIONS TO STEROIDS

William S. Johnson, Portola Valley, Calif., and Michael B. Gravestock, Bramhall, England, assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

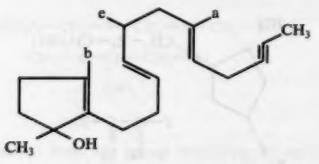
Continuation-in-part of Ser. No. 375,617, July 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 162,672, July 17, 1971, abandoned. This application Aug. 4, 1975, Ser. No. 601,742

Claims priority, application Canada, July 10, 1972, 146715

Int. Cl.[2] C07C *35/06*

U.S. Cl. 260—617 R **1 Claim**

1. A compound of the formula:



wherein:

a and *b* are hydrogen or lower alkyl of from 1 to 3 carbon atoms; and

e is hydrogen or lower alkyl of from 1 to 2 carbon atoms.

4,055,604

PROCESS FOR THE REDUCTION OF ALDEHYDES AND KETONES TO THE CORRESPONDING CARBINOLS

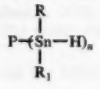
Ned M. Weinshenker, Palo Alto, Calif., assignor to Dynapol, Palo Alto, Calif.

Division of Ser. No. 467,951, May 8, 1974, Pat. No. 3,975,334. This application Jan. 28, 1976, Ser. No. 653,051

Int. Cl.[2] C07C *29/14, 29/00*

U.S. Cl. 260—618 H **2 Claims**

1. A process of reducing a carbonyl compound selected from among aldehydes and ketones to the corresponding carbinol which comprises contacting, in liquid phase, said compound with a porous, solid, insoluble polymeric organotin hydride compound of the formula



where P represents an organic polymer; R and R_1 each represent hydrogen, a lower alkyl group having from 1 to 5 carbon atoms, an aryl group having from 6 to 10 carbon atoms, or an aralkyl or alkaryl group having from 7 to 10 carbon atoms; and *n* is a positive value greater than 1 at a temperature and for a period of time necessary to reduce said carbonyl compound to a reduction reaction product; the amount of said solid polymeric organotin hydride compound used being at least equivalent, in equivalents, to the amount of reduction to be effected; hydrolysing the reduction reaction product to the carbinol by contact with dilute acid and recovering the carbinol.

4,055,605

PHENOL ALKYLATION

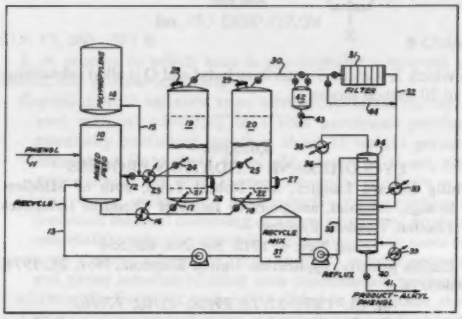
Charles L. Jarreau, Sr., Natchez, Miss., assignor to Calumet Petrochemicals, Inc., Natchez, Miss.

Filed Jan. 2, 1973, Ser. No. 320,265

Int. Cl.[2] C07C *39/06*

U.S. Cl. 260—624 R **2 Claims**

1. In the process of preparing monoalkylphenols wherein an olefin hydrocarbon having from 8 to 18 carbon atoms is reacted with a phenol selected from the group consisting of phenol, cresol, and xylenol in the presence of a catalyst consisting essentially of an acid activated clay, the improvement comprising passing a stream of the liquid mixture of phenol and olefin through a stationary bed of activated clay catalyst in granular form in a vertically elongated reaction zone at a rate corresponding to a space velocity of 0.2 to 0.5 volumes per volume of catalyst per hour and a temperature of 250° to 350° F., a portion of the olefin charged to said reaction zone being



introduced thereinto at an intermediate point therein, thereby increasing further the average mol ratio of phenol to olefin in said catalyst bed, said catalyst having an acid value of about 12–15, and acidity of about 3–3.4 pH, and a particle size of about 15 to 40 mesh, maintaining an excess of phenol in said catalyst bed corresponding to a mol ratio of about 1.5 to 3.5, distilling unreacted phenol from the stream leaving the catalyst and recycling said recovered phenol to said reaction zone.

4,055,606

NOVEL COPOLYESTER-POLYEPOXIDE COMPOSITIONS

Dusan C. Prevorsek, Morristown, and Shaul M. Aharoni, Morris Plains, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed June 21, 1976, Ser. No. 698,247

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—835 **19 Claims**

1. A copolyester-polyepoxide composition characterized by possessing a single discernible glass transition temperature before curing as measured by differential scanning calorimetry comprising:

A. a copolyester having a number average molecular weight in the range from about 6,000 to about 50,000; and

B. a polyepoxide mixture comprising high, intermediate and low molecular weight components wherein

a. about 25 to 75 weight percent of said mixture is said high molecular weight component having a weight average molecular weight in the range of above 25,000 to about 120,000 and an epoxide equivalent in the range from above 10,000 to about 60,000;

b. about 15 to 65 weight percent of said mixture is said intermediate molecular weight component having a weight average molecular weight in the range of above 3,000 to 25,000 and an epoxide equivalent in the range from above 1,600 to 10,000;

c. about 5 to 35 weight percent of said mixture is said low molecular weight component having a weight average molecular weight in the range of about 150 to 3,000 and an epoxide equivalent in the range from about 50 to 1,600, said polyepoxide mixture being present in an amount of at least 50% but not more than about 200% by weight based on said copolyester; and

C. an epoxy curing agent present in the amount from 0 to about 1.1 equivalents per epoxy equivalent.

4,055,607

ACRYLIC COATING COMPOSITIONS

Thomas R. Sullivan, Natrona Heights; Roger M. Christenson, Gibsonia; Suryya K. Das, Pittsburgh, and Rostyslaw Dowbenko, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 296,741, Oct. 11, 1972, abandoned. This application Aug. 7, 1975, Ser. No. 602,857
Int. Cl.² C08L *61/28, 51/08;* C08K *5/01*
U.S. Cl. 260—851 8 Claims

1. A thermosetting polymer composition comprising:
a. at least one polymer which is the copolymerization product of ethylenically unsaturated monomers, said ethylenically unsaturated monomers comprising
1. from about 4 to about 30 percent by weight hydroxy-containing ethylenically unsaturated monomer, and
2. from about 0.5 to about 15 percent by weight ethylenically unsaturated carboxylic acid;
b. an active solvent in which said polymer is dissolved to form a polymer solution;
c. at least 0.5 percent by weight microgel particles based on the weight of polymer solids in said composition, said microgel particles
1. being the addition copolymerization product of ethylenically unsaturated monomers and a dispersion stabilizer, said ethylenically unsaturated monomers comprising:
a. hydroxy-containing ethylenically unsaturated monomer, and
b. hydroxy-free ethylenically unsaturated monomers,
2. being substantially crosslinked,
3. being substantially insoluble in said active solvent,
4. being substantially insoluble in tetrahydrofuran,
5. having substantially the same refractive index as that of said dissolved polymer, and
6. being of size in the range of from about 1 to about 40 microns; and
d. an aminoplast resin in an amount in the range of from about 5 to about 50 percent by weight of said composition wherein
e. said dispersion stabilizer in said microgel particles is a branched copolymer containing two polymeric segments of which one segment is solvated by an aliphatic hydrocarbon dispersing liquid and said second segment is
1. an anchor polymer of different polarity to said first segment,
2. relatively non-solvatable by said dispersing liquid, and
3. contains pendant groups which have been addition copolymerized with said ethylenically unsaturated monomers of said microgel particles.

4,055,608

DYEABLE POLYPROPYLENE CONTAINING BISULFATE

Wassily W. Poppe, Lombard, and Mark D. Inskeep, Downers Grove, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed July 6, 1976, Ser. No. 702,438
Int. Cl.² C08L *77/00*
U.S. Cl. 260—857 L 27 Claims

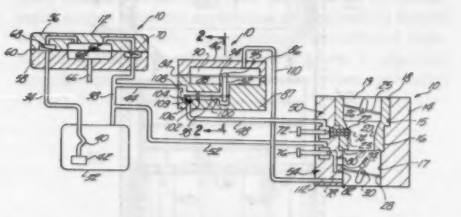
1. A resinous composition comprising from about 40 to 99.4 parts by weight resinous polymer of propylene, from about 0.1 to 10 parts by weight alkali metal bisulfate and from 0.5 to 50 parts by weight thermoplastic amino polymer.

4,055,609

CARBURETOR AND FUEL SUPPLY SYSTEM

Harold E. Phelps, Bellville, Mich., assignor to Harold Phelps, Inc., Plymouth, Mich.

Continuation-in-part of Ser. No. 534,274, Dec. 19, 1974, abandoned. This application Dec. 18, 1975, Ser. No. 642,015
Int. Cl.² F02M *17/04*
U.S. Cl. 261—36 A 13 Claims



1. A fuel supply system for operating an engine in various positions, including an inverted position, comprising; a housing, a mixing passage in said housing for supplying a mixture of fuel and air to the engine, a throttle valve in said passage for controlling the supply of air and fuel mixture to the engine, a pump having an inlet and an outlet, said inlet being connected to a source of fuel for receiving fuel therefrom, a return conduit connected to said outlet and to said source for returning fuel from said pump to said source, means operatively associated with said inlet for restricting fuel flow to said outlet to maintain fuel pressure at said outlet less than the pressure upstream from said inlet, a main metering system communicating with said return conduit and said mixing passage to deliver fuel for operating the engine in a high speed range, an idle metering system communicating with said return conduit to supply fuel to the mixing passage downstream from the throttle valve for operating the engine in the idle speed range, and valve means in said main metering system responsive when said pump is not operating to close said main metering system, a valve in said idle metering system movable between open and closed positions, and control means responsive to pressure upstream from said inlet to open and responsive to the absence of pressure to close said valve.

4,055,610

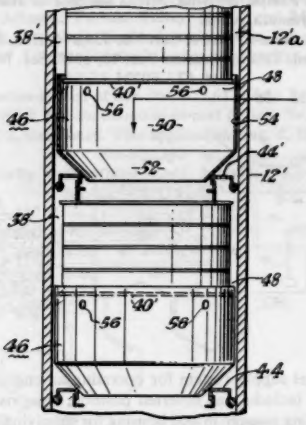
PREVENTING WALL LEAKAGE IN CONTACT TOWERS

Max Leva, One Hodgson Ave., Pittsburgh, Pa. 15205, and Joseph L. Leva, 1485 McFarland Road, Pittsburgh, Pa. 15216

Filed June 24, 1975, Ser. No. 589,875
Int. Cl.² B01D *3/18, 47/12*
U.S. Cl. 261—114 R 12 Claims

1. A gas-liquid contact tower comprising an outer tower shell, a plurality of superimposed generally horizontal contact plates within said tower, said plates being grouped into at least one subassembly thereof, means for removably supporting said plate subassembly within said tower shell, and a baffle arrangement mounted within said tower shell and adjacently overlying said plate subassembly, said baffle arrangement including a cylindrical section closely but spacedly and removably fitted within adjacent inner wall surfaces of said tower shell and a frustonconical section for directing fluid from said cylindrical baffle section onto a contact plate immediately underlying said baffle arrangement, said baffle arrangement being thereby shaped to minimize or substantially preclude splashing of said shell walls, said cylindrical section having sufficient height to

afford that flow resistance which would substantially preclude flow of condensible vapor through an annular space between



said shell inner wall surfaces and outer surfaces of said cylindrical baffle section.

4,055,611

SHORT GLASS FIBERS COVERED WITH POLYMERIC MATERIALS

Uwe Hucks, Duisburg, and Hugo Vernaleken, Krefeld-Bockum, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 25, 1975, Ser. No. 561,827
Claims priority, application Germany, Mar. 27, 1974, 2414804
Int. Cl.² B29C *3/00;* **B22D** *13/04, 23/08, 19/00*
U.S. Cl. 264—6 **11 Claims**

11. A process for the production of spheres of high molecular weight organic thermoplastic resins filled with fibers selected from the group consisting of mineral fibers, carbon fibers and other inorganic fibers exclusive of glass fibers having an average diameter of between 1 and 15 mm and containing from 1 to 30% by weight of high molecular weight thermoplastics comprising:

a. mixing said fibers having an average length of between 0.1 and 10 mm in a 1 to 30% strength by weight solution of high molecular weight thermoplastics having a viscosity of less than 1000 cP;

b. rotating the mixture of said fibers and high molecular weight thermoplastics solution in an apparatus which rotates about an axis which passes through said apparatus to form spheres of high molecular weight thermoplastics filled with said fibers; and

c. subsequently drying the spheres of high molecular weight thermoplastics filled with said fibers to free said spheres from solvent.

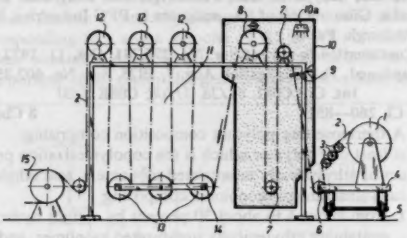
4,055,612

TREATING OF TRAVELLING WEBS

Peter Zimmer, Untere Sparchen 54, A 6330 Kufstein (Tirol), Austria

Continuation of Ser. No. 332,275, Feb. 14, 1973, abandoned. This application Dec. 12, 1974, Ser. No. 532,250
Claims priority, application Austria, Feb. 15, 1972, 1206/72
Int. Cl.² B65H *25/26*
U.S. Cl. 264—40.7 **12 Claims**

12. A method for forwarding a relatively inelastic textile web from a web supply toward a printing station at which the longitudinal edges of the web are required to travel along a predetermined path, comprising the steps of moving the web in longitudinal direction under tension from the supply means along said predetermined path towards said printing station; moving the supply means in a direction transverse to said longitudinal direction if the web deviates from said predetermined path; and heating a major portion of the tensioned web



to enhance its stretchability to avoid fold formation during movement of the web in said transverse direction.

4,055,613

PRODUCTION OF THREE-DIMENSIONAL DESIGNS

Ales M. Kapral, Menasha, Wis., assignor to Akrosil Corporation, Menasha, Wis.

Filed Oct. 23, 1974, Ser. No. 517,175
Int. Cl.² B29D *27/04;* **B29C** *1/02, 1/04*
U.S. Cl. 264—46.4 **13 Claims**

1. Method of producing a foamed resin sheet having a three-dimensional pattern or design thereon which comprises applying a heat-foamable plastic material in the form of a two-dimensional pattern on a flexible sheet or web, then heating said heat-foamable plastic material to cause said heat-foamable plastic material to unite with said sheet or web and to expand forming a three-dimensional pattern on said sheet or web and thus form a master mold form, applying a release coating to the three-dimensional surface of said flexible sheet or web, depositing a layer of a foamable resin plastisol upon the surface of said three-dimensional pattern, heating said layer to gel, fuse and foam said layer to form a foamed resin object, and removing said master mold form from said foamed resin object to expose the three-dimensional pattern thereon.

7. Method of producing a resin sheet having a three-dimensional pattern or design thereon which comprises applying a heat-foamable plastic material in the form of a two-dimensional pattern on a flexible sheet or web, then heating said heat-foamable plastic material to cause said heat-foamable plastic material to unite with said sheet or web and to expand forming a three-dimensional pattern on said sheet or web and thus form a master mold form, applying a release coating to the three-dimensional surface of said sheet or web, depositing a layer of fluid non-foaming resin upon the surface of said three-dimensional pattern, curing said layer while said layer is in contact with said three-dimensional surface to form a solid resin article and removing said sheet or web from said fused resin article to expose the three-dimensional pattern thereon.

4,055,614

METHOD OF FIRING FORMED CERAMIC BODY

Akira Morikawa, and Yoshinori Narita, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 488,679, July 15, 1974, abandoned.
This application Jan. 29, 1976, Ser. No. 653,527
Claims priority, application Japan, July 24, 1973, 48-83470
Int. Cl.[2] C04B *33/32*
U.S. Cl. 264—59 6 Claims

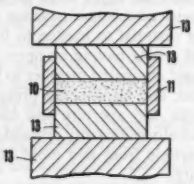
1. A method of firing a formed raw ceramic body containing not less than 15% by weight of resinous organic components as a plasticizer and bonding agent and 100 parts by weight of inorganic components, comprising the steps of covering such a formed raw ceramic body with a metal foil capable of being oxidized at a high temperture, and firing said metal foil-covered raw ceramic body in an ordinary oxidizing atmosphere to sinter said body, said metal foil being gradually oxidized at a temperature greater than 250° C said foil suppressing oxidiation of said organic components thereby preventing cracking of the ceramic body without lowering the firing temperature.

4,055,615

METHOD OF MANUFACTURING ELECTRIC RESISTORS

Yasuo Ikeda, 500, Toyoshina, Minamiazumi, Nagano, Japan

Filed Sept. 17, 1974, Ser. No. 506,791
Claims priority, application Japan, Sept. 21, 1973, 48-107179
Int. Cl.[2] G04B *35/00*
U.S. Cl. 264—105 11 Claims



1. A method of manufacturing a thin, flat, flexible electrical resistor heating element for use in electric blankets, said method comprising the steps of:

a. mixing tetrafluoropolyethylene powder and a mixture of carbon powder and metal powder to form an admixture, said mixture of carbon and metal powders not exceeding 30% by volume of said tetrafluoropolyethylene powder in said admixture;

b. charging said powder admixture in a metal mold;

c. compressing said powder admixture in said mold for a sufficient time interval to eliminate air voids and bond said powder admixture into a compressed body;

d. removing said compressed body from said mold;

e. sintering said compressed body to form a sintered body; and

f. cutting said sintered body into at least one flat, flexible electrical resistor.

4,055,616

METHOD FOR SEPARATING SECTIONS OF A COVERING ON A CABLE

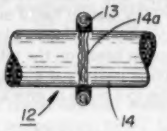
Ralph H. Keen, Arvada, and Gary G. Seaman, Broomfield, both of Colo., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,249
Int. Cl.[2] B23P *19/02*
U.S. Cl. 264—139 5 Claims

1. A method of desheathing a round cable formed of a thermoplastic cable jacket enclosing a plurality of conductors having thermoplastic insulation thereon, which comprises:

surrounding an annular section of the thermoplastic cable jacket adjacent a leading end portion of the cable with an annular heat source;

heat-softening the material of the annular cable jacket section about the entire circumference thereof without contacting the jacket and without softening the thermoplastic insulation on the conductors, the width of the heat-softened section being sufficiently narrow that it will not elongate any significant amount when the jacket is separated along a line defined by the heat-softened circumferential section upon the application of longitudinal tension to the jacket, whereby the separated heat-softened material of the section will reharden to form a relatively smooth edge along the line of separation when application of heat thereto is terminated;



applying tension to the cable jacket on opposite sides of the heat-softened annular section to separate the jacket along the heat-softened section and to expose the insulated conductors;

terminating the application of heat upon separation of said jacket and within a time sufficient to preclude damage to the exposed insulation on the cable conductors and to reharden the heat-softened material of the remaining jacket on the cable to form a smooth edge along the line of separation of the jacket; and

removing the leading end portion of the jacket from the cable.

4,055,617

PROCESS FOR PREPARING GRANULAR POTASSIUM SORBATE

Yasuyoshi Taga, and Masaharu Wakasone, both of Ogaki, Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 21, 1976, Ser. No. 678,983
Claims priority, application Japan, Apr. 26, 1975, 50-50909
Int. Cl.[2] C07C *57/10*
U.S. Cl. 264—141 2 Claims

1. A process for preparing granular potassium sorbate, which comprises the steps of

a. adding water to powdery potassium sorbate in an amount of 2 to 8% by weight based on the weight of the potassium sorbate,

b. kneading the resulting mixture at a temperature of 10° to 45° C. for 10 minutes to 4 hours to give a uniformly wetted powder,

c. supplying the wetted powder to a hopper of a screw type extruding machine equipped with a perforated cylinder die at a vicinity of an end of a screw, and extruding it under an extruding pressure at said die of 10 to 50 kg./cm^2., and an extruding rate at said die of 1 to 4 g./cm^2.sec. to give a vermicelli-like extrudate, and

d. drying the extrudate to give granules having a volatile material content of not more than 0.1% by weight.

4,055,618

PROCESS FOR PREPARING GRANULAR SORBIC ACID

Shigemi Fujita, Gifu, and Masaru Goto, Hirakata, both of Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 15, 1976, Ser. No. 723,484

Claims priority, application Japan, Sept. 23, 1975, 50-115026; Nov. 21, 1975, 50-140406

Int. Cl.[2] C07C *57/10*

U.S. Cl. 264—141 2 Claims

1. A process for preparing granular sorbic acid, which comprises the steps of

a. adding at least one member selected from the group consisting of water and lower alkyl alcohols having 1 to 3 carbon atoms to powdery sorbic acid having a particle size of 30 to 150 μ, said water being employed in an amount of 8 to 35% by weight based on the total weight and said lower alkyl alcohol being employed in an amount of 5 to 25% by weight based on the total weight,

b. kneading the resulting mixture at a temperature of 10° to 45° C. for 10 minutes to 4 hours to give a uniformly wetted powder,

c. supplying the wetted powder to a hopper of a screw type extruding machine equipped with a perforated-cylinder die in the vicinity of an end of a screw, and extruding it under an extruding pressure at a die of 10 to 50 kg./cm.^{2}, and an extruding rate at a die of 1 to 4 g./cm.^{2}sec. to give a vermicelli-like extrudate, and

d. drying the extrudate to give granules having a volatile material content of not more than 0.1% by weight.

4,055,619

TIRE MANUFACTURE

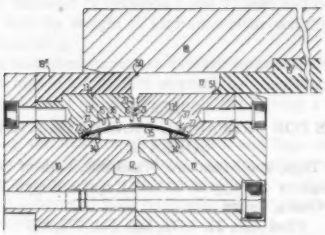
Anthony Gerald Goodfellow, Maghull, near Liverpool, England, assignor to Dunlop Limited, London, England

Filed May 28, 1975, Ser. No. 581,587

Claims priority, application United Kingdom, May 28, 1974, 23564/74

Int. Cl.[2] B29D *3/02;* B29H *3/12*

U.S. Cl. 264—258 2 Claims



1. A method of molding the tread portion of a pneumatic tire which minimizes the displacement of axially extending cords in a breaker structure incorporated therein, the method comprising

locating on the radially inner surface of an annular mold cavity for the tread portion an annular breaker structure having a single layer, or a radially outermost layer, consisting of parallel cords extending axially of the cavity and

introducing uncured rubber into the cavity substantially uniformly in terms of volume and pressure around the circumference of the cavity through an annular gate in the radially outer surface of the cavity, said gate lying in a plane substantially perpendicular to the axis of the cavity whereby the incoming flow of uncured rubber into the cavity divides and flows toward the opposite axial ends of the cavity substantially without any flow in the circumferential direction so that it does not tend to displace the cords as the cavity is filled.

4,055,620

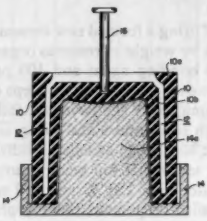
FLEXIBLE MOLD AND PROCESS

Jack R. Conrad, 3071 Club House Circle, Costa Mesa, Calif. 92626

Filed Sept. 7, 1976, Ser. No. 721,038

Int. Cl.[2] B29C *5/00, 7/00;* B29D *23/00*

U.S. Cl. 264—313 2 Claims



1. In a method of making a substantially cylindrical article having an open end and a closed end, said closed end having an aperture therein, the steps comprising:

supporting an expansible mold having radially spaced inner and outer walls defining an annular cavity therebetween, said annular cavity being closed at one end and open at another end thereof, said mold also having an upper mold surface extending between end portions of said inner wall; inserting an elongated member through the open end of said cavity and into the upper mold surface;

filling said cavity with a hardenable casting material; permitting said casting material to harden to form the substantially cylindrical article having an open end and a cosed end; removing said elongated member to form an aperture in the closed end; and introducing pressurized fluid into the mold through said aperture and causing said outer wall to move radially outwardly releasing said article and removing said article from said mold through said open end of said cavity.

4,055,621

PROCESS FOR OBTAINING TITANIUM TETRACHLORIDE, CHLORINE AND IRON OXIDE FROM ILMENITE

Shigenori Okudaira, Chigasaki; Mitsuo Takahashi, Tokyo; Takefumi Irie, Chigasaki; Eiji Itoh, Urawa, and Koh Kashiwagi, Hiratsuka, all of Japan, assignors to Nihon Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 3, 1975, Ser. No. 583,382

Claims priority, application Japan, June 7, 1974, 46-64133

Int. Cl.[2] C01B *7/00;* C01G *23/02, 49/06, 49/08*

U.S. Cl. 423—79 29 Claims

17. A process for obtaining chlorine and iron oxide from iron chloride comprising the steps of:

adding iron oxide to iron chloride preliminarily prepared by chlorinating iron-containing titanium ore, said iron oxide being added in an amount of more than 10 percent by weight based on the weight of the resulting mixture,

charging the mixture of iron oxide and iron chloride is solid phase into a fluidizing roasting furnace,

blowing oxygen-containing gas into the fluidizing roasting furnace from its bottom to form a fluidized bed of said mixture and to effect the oxiding roasting in the fluidizing roasting furnace at a temperature of 600 to 1000 C,

removing the chlorine from the fluidizing roasting furnace adjacent the top thereof,

extracting the overflow from said fluidized bed in the fluidizing roasting furnace,

charging the extracted overflow into a secondary roasting furnace for additional oxidizing roasting and for purging chlorine gas present in interstices between the overflow particles, and

removing iron oxide from the secondary roasting furnace.

4,055,622

PROCESS FOR THE PRODUCTION OF ZEOLITIC ALKALI METAL ALUMINOSILICATES

Peter Christophliemk, Dusseldorf; Wolfgang Friedemann, Neuss; Ernst Vaeth, and Karl-Heinz Worms, both of Dusseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, both of, Germany

Filed July 16, 1976, Ser. No. 705,791

Claims priority, application Germany, July 26, 1975, 2533614

Int. Cl.[2] C01B *33/28*

U.S. Cl. 423—118 **8 Claims**

1. A process for the production of zeolitic alkali metal aluminosilicates from alkali metal aluminate solutions containing alkali metal sulfate impurities consisting essentially of the steps of

a. mixing an aqueous alkali metal silicate solution with an aqueous alkali metal aluminate solution

1. containing an alkali metal sulfate having a molar ratio of Al_2O_3 to sulfate of 1:0.35 to 1.25 under agitation at a precipitation temperature of from 0° C to 110° C,

2. in such amounts that the resulting mixture has a molar ratio of alkali oxide : Al_2O_3 : SiO_2 of 1.5 to 6.0:1.0:1 to 5.0, wherein

3. the alkali metal oxide is present in a stoichiometric excess with respect to SiO_2,

4. the excess of alkali metal oxide over unity as well as the alkali metal oxide concentration is decreased when the sulfate content is increased, and

5. the alkali metal oxide : Al_2O_3 : SiO_2 solids content of the resultant aqueous mixture is maintained between 10% to 40% by weight,

b. subjecting the aqueous precipitate to a homogenization by application of shearing forces,

c. converting the amorphous homogenized slurry to a crystalline state by maintaining the slurry at a crystallization temperature of between about 40° C and 120° C,

d. determining the calcium binding power of the crystalline aluminosilicate formed, and

e. (6) discontinuing the conversion step (c) by cooling and separating the crystalline aluminosilicate when substantially the optimum calcium binding power is attained.

4,055,623

METHOD OF REMOVING NITROGEN OXIDES FROM A GAS AS A SALT OF IMIDODISULFONIC ACID

Shigeru Saitoh; Tetsuya Watanabe; Koji Konno, and Tadashi Nakamura, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 651,422, Jan. 22, 1976, Ser. No. 542,778, Jan. 21, 1975, Pat. No. 3,992,508, and Ser. No. 542,777, Jan. 21, 1975, Pat. No. 3,991,161, said Ser. No. 651,422, is a division of Ser. No. 517,370, Oct. 23, 1974. This application July 7, 1976, Ser. No. 703,200

Claims priority, application Japan, Jan. 21, 1974, 49-9158; May 10, 1974, 49-51934; Dec. 4, 1974, 49-138967; Dec. 4, 1974, 49-138969

The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.

Int. Cl.[2] C01B *21/00*

U.S. Cl. 423—235 **9 Claims**

1. A method for removing nitrogen oxides from a gas mixture, in the form of a solid salt of imidodisulfonic acid comprising:

contacting the gas mixture with an aqueous scrubbing solution containing at least 0.02% by weight of at least one ferrous salt and at least 0.2% by weight of at least an alkali salt of sulfurous acid to absorb the nitrogen oxides, thereby forming an alkali salt of imidodisulfonic acid in solution;

cooling the solution containing the alkali salt of imidodisulfonic acid to solidify said alkali salt of imidodisulfonic acid; and

separating the solidified salt of imidodisulfonic acid from solution.

4,055,624

PROCESS FOR REMOVING NITROGEN OXIDES FROM GASEOUS MIXTURES

Hiroyuki Yoshida, and Katumi Saga, both of Koriyama, Japan, assignors to Hodogaya Chemical Co., Ltd.

Continuation of Ser. No. 510,800, Sept. 30, 1974, abandoned. This application Sept. 20, 1976, Ser. No. 724,974

Claims priority, application Japan, Oct. 3, 1973, 48-110437

Int. Cl.[2] C01B *21/00*

U.S. Cl. 423—235 **7 Claims**

1. A process for removing nitrogen oxides from a waste gas containing the nitrogen oxides and sulfur dioxide which comprises the step of contacting said waste gas, first, at a temperature from room temperature to 80° C with an aqueous acid solution consisting essentially of at least one chlorate selected from the group consisting of sodium chlorate, potassium chlorate, ammonium chlorate, calcium chlorate and barium chlorate and 1 to 80% by weight of an inorganic acid, selected from the group consisting of nitric acid, sulfuric acid and hydrochloric acid and then, with a liquid selected from the group consisting of an aqueous solution or dispersion of a basic compound and an aqueous alkaline solution or dispersion of at least one compound selected from the group consisting of alkali metal sulfides, alkali metal sulfites and hydrogen peroxide.

4,055,625

METHOD OF TREATMENT OF A MIXTURE OF AIR AND AT LEAST PARTIALLY RADIOACTIVE RARE GASES

Pierre Faugeras, Versailles; Pierre Lecoq, La Queue-en-Brie; Pierre Miquel, Chatillon; Hubert Rouyer, Antony, and Guy Simonet, Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed July 3, 1975, Ser. No. 592,949

Claims priority, application France, July 31, 1974, 74.26520; Apr. 17, 1975, 75.11965

Int. Cl.[2] C01B *23/00*

U.S. Cl. 423—262 **5 Claims**

1. A method for treating radioactive effluent gases obtained from reprocessing of irradiated nuclear fuels containing xenon, and krypton which is radioactive in air by treating a mixture thereof also containing oxygen, nitrogen oxides, gaseous carbon dioxide, water vapor, argon and hydrocarbons comprising

i. removing nitrogen oxides, gaseous carbon dioxide, water vapor and hydrocarbons contained in said effluent gas mixture therefrom, thereafter

ii. liquifying the oxygen in said effluent gas mixture and distilling off gaseous nitrogen oxides a portion of the oxygen, and argon contained therein in a cyrogenic distillation column thereby forming a concentrated liquified mixture in the lower portion thereof, said concentrated liquified mixture also containing ozone formed from oxygen in the radioactive medium,

withdrawing a fraction of said ozone-containing liquified mixture from said distillation column and dissociating said ozone in said liquified mixture and then returning said liquified mixture to said distillation column, and removing a liquified mixture of oxygen containing xenon and krypton from the lower portion of said distillation column, then

iii. adding hydrogen to said oxygen containing xenon and krypton and catalytically combining said oxygen with said hydrogen to form water and removing said water, to form an admixture of xenon and krypton, and

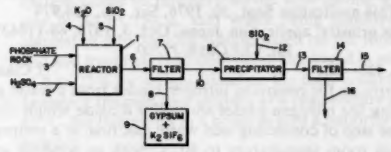
iv. cryogenically distilling said admixture of xenon and krypton to distill the krypton as a gas from liquid xenon and recovering said xenon.

4,055,626

METHOD OF PRODUCING FLUORIDE-FREE PHOSPHORIC ACID

Erhart Karl Drechsel, Houston, Tex., and John B. Sardisco, Shreveport, La., assignors to Pennzoil Company, Shreveport, La.

Filed June 15, 1976, Ser. No. 696,290
Int. Cl.[2] C01B *25/16*
U.S. Cl. 423—320 **7 Claims**



1. A method for the preparation of phosphoric acid by the steps which comprise:

a. reacting a fluorine-containing phosphate rock with sufficient sulfuric acid to acidulate said rock in an acidulation reactor, said reaction being conducted in the presence of:

1. potassium ion provided by addition of a member selected from the group consisting of KH_2PO_4, $KHSO_4$, K_2SO_4, KOH and mixtures thereof in sufficient amounts to combine with the fluorine liberated from the phosphate rock during acidulation and in a sufficient excess amount that the phosphoric acid recovered from the reaction will contain about 0.5 to 1.0 weight percent potassium ion as K_2O; and
2. in the presence of a sufficient amount of silicon dioxide to combine with the fluorine liberated during acidulation of the rock and a sufficient excess amount of the silicon dioxide to provide about 0.003 to 0.015 parts of silicon dioxide per part of P_2O_5 in the phosphoric acid recovered;

b. forming a resulting slurry of gypsum solids in phosphoric acid and removing the slurry from the acidulation reactor; and

c. separating the gypsum solids from the phosphoric acid and recovering gypsum solids containing precipitated potassium silicofluoride and a phosphoric acid solution substantially free of fluorine.

4,055,627

PROCESS FOR TREATING GASES IN THE AMMONIA SYNTHESIS

Mario Guadalupi, Via Tiziano, 18, Milan, Italy

Filed Nov. 13, 1970, Ser. No. 89,343
Claims priority, application Italy, Nov. 15, 1969, 24469/69; May 29, 1970, 25266/70; Aug. 27, 1970, 29055/70
Int. Cl. C01b *2/30*
U.S. Cl. 423—359 **13 Claims**

1. A process for treating the effluent gases from an ammonia synthesis reactor and for recycling such gases with fresh gases to such reactor comprising the following steps:

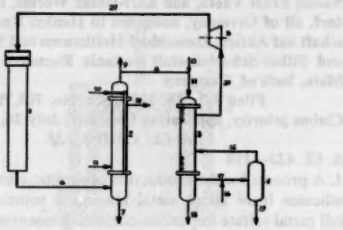
absorbing ammonia contained in the effluent gases discharged from the synthesis reactor in the liquid film of a film absorber and obtaining a strong ammonia solution;

blending the effluent gases discharged from said liquid film absorber with fresh gases for feed to said reactor into a heat exchanger and condensing the water contained in the blended effluent and fresh gases;

removing the condensed water from said heat exchange as a weak ammonia solution;

injecting liquid ammonia into gases discharged from said heat exchanger;

feeding said discharged gases with said liquid ammonia injected therein into a separator and separating from said feed in said separator cooled dry gases and a strong solution of ammonia;



feeding said cooled dry gases from said separator into said heat exchanger to cool and condense the water in the blended effluent and fresh gases being fed into said heat exchanger; and

feeding said blended effluent and fresh gases, after the water contained therein has been condensed, from said heat exchanger to said ammonia synthesis reactor.

4,055,628

METHOD FOR PREPARING GRAPHITE CONTAINING CARBON

John James McCarroll, Camberley; John Trevor Kent Clark, Weybridge, and Stephen Robert Tennison, New Haw, all of England, assignors to The British Petroleum Company Limited, London, England

Continuation-in-part of Ser. No. 606,420, Aug. 21, 1975, abandoned. This application Sept. 22, 1976, Ser. No. 725,586
Claims priority, application United Kingdom, Sept. 2, 1974, 38182/74; Sept. 2, 1974, 38183/74
Int. Cl.[2] C01B *31/02, 31/04;* B01J *21/18*
U.S. Cl. 423—448 **8 Claims**

1. A method for the preparation of a graphite-containing carbon having (1) a basal plane surface area of at least 100 m^2/g; (2) a ratio of BET surface area to basal plane surface area of not more than 5:1; and (3) a ratio of basal plane surface area to edge surface area of at least 5:1, which method comprises treating a high surface area carbon having a BET surface area of at least 500 m^2/g to the steps of (1) an initial heat treatment in an inert atmosphere at a temperature between 900° C and 3300° C; (2) oxidation stage by heating in an oxidizing atmosphere at a temperature between 300° and 1200° C; and (3) a further heat treatment in an inert atmosphere at a temperature between 1000° C and 3000° C.

4,055,629

PROCESS FOR THE REMOVAL OF SELENIUM COMPOUNDS FROM URETHANE SOLUTIONS

Rudolph Rosenthal, Broomall, and Edward T. Shawl, Wallingford, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 13, 1976, Ser. No. 750,109
Int. Cl.[2] C01B *19/00;* C01G *3/02*
U.S. Cl. 423—509 **12 Claims**

1. A process for the recovery of selenium from selenium-containing urethane solutions derived from the selenium catalyzed reaction of an organic compound containing at least one hydroxyl group with carbon monoxide and a nitrogenous organic compound at elevated temperatures and pressures in the presence of a base and/or water, which comprises the steps of:

contacting the selenium-containing urethane solution at a temperature in the range of from about ambient to about

150° C. with copper (I) chloride at a weight ratio of copper to contained selenium of about 1:10, from about 5 to about 50 parts by weight based on urethane solution treated of an alkyl, aryl or aralkyl amine or alkyl, aryl or substituted aryl nitrile complexing solvent, and oxygen or an oxygen-containing gas at a pressure of from about 0.1 to about 5 atmospheres to form an insoluble copper-selenium compound or complex precipitate in solution;

separating the insoluble precipitated compound or complex from the solution;

treating said insoluble copper-selenium compound or complex with air or oxygen at a temperature of from about 300° C. to 650° C. to convert the selenium to selenium dioxide and the copper to copper oxide to separate selenium and copper; and

recovering said copper oxide and selenium dioxide.

4,055,630

PROCESS FOR THE RECOVERY OF SELENIUM FROM URETHANES CONTAINING SELENIUM OR COMPOUNDS THEREOF

John J. McCoy, Media, and John G. Zajacek, Devon, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 603,998, Aug. 12, 1975. This application Nov. 10, 1976, Ser. No. 740,684

Int. Cl.² C01B *19/00*

U.S. Cl. 423—509 **6 Claims**

1. A process for the recovery of selenium or compounds thereof from selenium-containing urethane solutions derived from the selenium catalyzed reaction of an organic compound containing at least one hydroxyl group with carbon monoxide and a nitrogenous organic compound at elevated temperatures and pressures in the presence of a base and/or water, which comprises treating said urethane solution with a mixture of metals and metal oxides at a temperature in the range of from about 25° to 250° C. to retain and remove said selenium or compound thereof from said urethane solution, said metals and metal oxides being selected from metals and oxides of Group IB, IIB, VIB and VIIIB metals of the Periodic Table of Elements, recovering the treated urethane solution, and subjecting the mixture of metal and metal oxide with retained selenium or compounds thereof to treatment with air or oxygen at a temperature of from 250° to 800° C. and pressures of up to 50 atmospheres to convert the selenium to selenium dioxide, and recovering said selenium dioxide from said mixture of metal and metal oxide for reuse in said selenium catalyzed reaction.

4,055,631

PRODUCTION OF IRON SULFATE MONOHYDRATE

Patrick J. McGauley, Port Washington, N.Y., and Abraham A. Dor, Lakewood, Ohio, assignors to The Hanna Mining Company, Cleveland, Ohio

Continuation of Ser. No. 410,217, Oct. 26, 1973, abandoned, which is a division of Ser. No. 113,553, April 13, 1971, Pat. No. 3,860,696. This application Dec. 15, 1975, Ser. No. 640,939

Int. Cl.² C01G *49/14*

U.S. Cl. 423—558 **6 Claims**

1. The process for producing high purity crystals of ferrous sulfate monohydrate from a purified solution that is essentially saturated with ferrous sulfate at temperatures of 50° to 80° C. which comprises the steps of:

a. cooling the solution to a temperature below about 50° C. to precipitate crystals of ferrous sulfate heptahydrate,

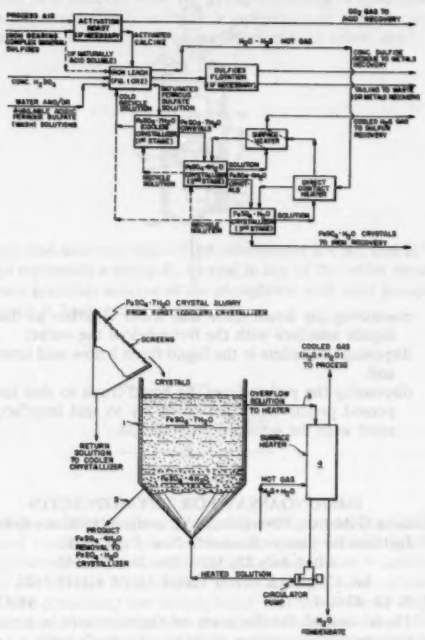
b. separating the crystals of ferrous sulfate heptahydrate from the solution at a temperature below about 50° C.,

c. pulping the crystals of ferrous sulfate heptahydrate in a hot purified aqueous solution that is essentially saturated with ferrous sulfate to produce a high density slurry of crystals,

d. heating the slurry of crystals to a temperature of from about 56.5° to about 64.8° C to dehydrate a fraction of the crystals from $FeSO_4.7H_2O$ to $FeSO_4.4H_2O$,

e. separating the crystals of $FeSO_4.4H_2O$ from the slurry,

f. pulping the crystals of $FeSO_4.4H_2O$ in a hot purified aqueous solution that is essentially saturated with ferrous sulfate to produce a second high density slurry of crystals,



g. heating the second slurry with hot gases to a temperature above 65° C. to evaporate the water and to produce dry solids that are essentially pure crystals of ferrous sulfate monohydrate, and

h. collecting the crystals of ferrous sulfate monohydrate as product of the process.

4,055,632

CONTROLLABLE GAS GENERATOR

Robert T. Hoffman, and Roger W. Buecher, both of Kailua, Hawaii, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 22, 1976, Ser. No. 753,026

Int. Cl.² C01B *1/05;* B01J *7/02*

U.S. Cl. 423—657 **6 Claims**

1. A gas generator comprising:

an elongated container having a top and a bottom;

first and second liquids and pellets, the pellets being nonreactive with and floatable in the first liquid and reactive with and nonfloatable in the second liquid;

the first and second liquids being disposed in the container, and the first liquid being denser than the second liquid so that the first and second liquids form an interface;

a partition mounted in the container below the level of said interface for dividing the container into top and bottom compartments;

the pellets being disposed in the bottom compartment with the first liquid;

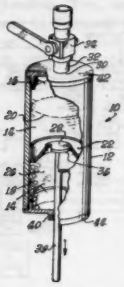
valve means mounted in the partition for dispensing the pellets,

whereby upon opening the valve means pellets will exit therethrough and ascend in the first liquid to said interface

where the pellets will react with the second fluid to generate the gas.

6. A method of generating gas comprising the steps of:

providing liquid freon and water and sodium borohydride pellets, the pellets being nonreactive with and floatable in the freon and reactive with and nonfloatable in the water;



containing the liquid freon and water together so that the liquids interface with the freon below the water;

disposing the pellets in the liquid freon below said interface; and

dispensing the pellets from the liquid freon so that the dispensed pellets will float upwardly to said interface and react with the water to generate gas.

4,055,633

IMMUNOASSAY FOR THYMOPOIETIN

Gideon Goldstein, Riverdale, N.Y., assignor to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed July 28, 1976, Ser. No. 709,565

Int. Cl.[2] A61K *43/00*; G01N *33/16*; G21H *5/02*

U.S. Cl. 424—1 **18 Claims**

11. A method for the assay of thymopoietin in a sample, which method comprises mixing said sample with a known amount of labeled thymopoietin and an antibody which will selectively complex with said thymopoietin, separating the resulting antibody-antigen complex from the supernatant, measuring the degree of binding of the said labeled thymopoietin in said complex and determining the amount of thymopoietin present in said sample by comparing said degree of binding to a standard curve obtained by mixing known amounts of thymopoietin with fixed amounts of said labeled thymopoietin and said antibody and determining the degree of binding for each known amount of thymopoietin.

4,055,634

ANTIPERSPIRANTS

Wolf Brenner, Fullinsdorf; Gustav Erlemann, Basel, and Horst Pauling, Bottmingen, all of Switzerland, assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

Filed Feb. 11, 1975, Ser. No. 549,241

Claims priority, application Switzerland, Feb. 22, 1974, 2538/74; Dec. 3, 1974, 16014/74

Int. Cl.[2] A61K *7/38*; C07F *5/06*

U.S. Cl. 424—47 **14 Claims**

1. An antiperspirant/deodorant composition which contains (a) a compatible cosmetically acceptable aerosol propellant and (b) as the active ingredient 1% to 30% by weight of one or a mixture of compounds represented by the formula

$$(R_1)_mAl(OR_2)_n \qquad 1$$

wherein m and n each are 1 or 2 and the sum of m and n is 3; R_1 is alkyl containing from 2 to 30 carbon atoms; R_2 is substituted and unsubstituted radicals selected from the group consisting of alkyl containing from 1 to 20 carbon atoms, cycloalkyl containing 5 or 6 carbon atoms, alkenyl containing from 1 to 20 carbon atoms, cycloalkenyl containing 5 to 6 carbon atoms, aryl having 1 or 2 aromatic nuclei, alkanoyl containing from 20 to 30 carbon atoms, alkenoyl containing from 2 to 30 carbon atoms and aroyl having 1 to 2 aromatic nuclei; wherein the substituents on R_2 when R_2 is selected from the grouo consisting of alkyl, alkenyl, alkanoyl and alkenoyl and mixtures thereof are one or more of cycloalkyl containing 5 or 6 carbon atoms, cycloalkenyl containing 5 or 6 carbon atoms substituted cycloalkenyl containing 5 or 6 carbon atoms, aryl containing 1 or 2 aromatic nuclei, alkoxy containing 1 to 20 carbon atoms, cycloalkoxy containing 5 or 6 carbon atoms, cycloalkenyloxy contaning 5 or 6 carbon atoms, aryloxy containing 1 or 2 aromatic nuclei, alkyl containing 1 to 20 carbon atoms and alkoxy containing 1 to 20 carbon atoms and mixture thereof, substituted aryl containing 1 or 2 aromatic nuclei, cycloalkenyloxy containing 5 or 6 carbon atoms or aryloxy containing 1 or 2 aromatic nuclei; and wherein the substitutents on R_2 when R_2 is the said cycloalkyl, cycloalkenyl, aryl and aroyl groups are one or more of alkyl containing 1 to 20 carbon atoms, alkoxy containing 1 to 20 carbon atoms or aryl containing 1 or 2 aromatic nuclei; and when R_2 is phenyl, two adjacent alkyl and alkoxy substituents and mixture thereof on the phenyl can be joined to form a 5- or 6-membered saturated ring; when m is 2 and n is 1, R_2 can be

$$-(R_3O)_p-Al(R_1)_2 \qquad (a)$$

wherein R_1 has the significance above and each R_1 can be the same or different, R_3 is a straight chain alkylene of 2 to 4 carbons and p is 0, 1 or 2; when m is 1 and n is 2, R_2 has the significance above and each R_2 can be the same or different or when one R_2 is alkyl the other R_2 can be

(b)

wherein R_1 has the significance above and R_4 is alkyl containing 1 to 20 carbon atoms.

4,055,635

FIBRINOLYTIC COMPOSITIONS

Joseph Green, London, and Michael Anthony Cawthorne, Horsham, both of England, assignors to Beecham Group Limited, England

Filed July 2, 1974, Ser. No. 485,302

Claims priority, application United Kingdom, July 5, 1973, 32071/73

Int. Cl.[2] A61K *31/74, 37/48*

U.S. Cl. 424—78 **9 Claims**

1. A fibrinolytic pharmaceutical composition in unit dosage form suitable for administration by injection to humans which comprises an amount of a water soluble complex of a proteolytic enzyme sufficient to achieve the desired degree of fibrinolysis on administration to a human and linked covalently to a water-soluble polymeric substance having a molecular weight of from 10,000 to 500,000, said enzyme and said polymeric substance being present in the ratio of 1:2 to 1:50 said composition being substantially free of unreacted enzyme.

4,055,636

N^2-ALKOXYNAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

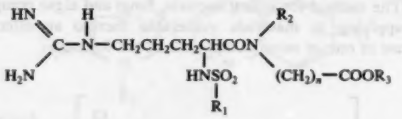
Shosuke Okamoto, Kobe; Ryoji Kikumoto; Kazuo Ohkubo, both of Tokyo; Tohru Tezuka, Yokohama; Shinji Tonomura, Tokyo; Yoshikuni Tamao, Yokohama, and Akiko Hijikata, Kobe, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo and Shosuke Okamoto, Kobe, both of, Japan

Continuation-in-part of Ser. No. 671,436, March 29, 1976, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Dec. 9, 1975, Ser. No. 638,985

Int. Cl.[2] A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 10 Claims

1. N^2-alkoxynaphthalenesulfonyl-L-argininamides having the formula:



and the pharmaceutically acceptable salts thereof, wherein R_1 is a naphtyl substituted with at least one C_1–C_5 alkoxy; R_2 is C_2–C_{10} alkyl or C_2–C_{10} alkoxyalkyl; R_3 is hydrogen or C_1–C_{10} alkyl; and *n* is an integer of 1, 2 or 3.

4,055,637

MEDICINAL PREPARATION FOR HEALING WOUNDS AND TREATING DERMATITES USING 1-(CHLOROMETHYL)SILATRANE

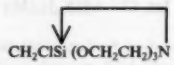
Mikhail Grigorievich Voronkov, ulitsa Lermontova, 315, kv.32; Ada Timofeevna Platonova, ulitsa Lermontova, 313, kv.31; Ljudmila Andreevna Mansurova, ulitsa Lermontova, 333, kv.153; Igor Georgievich Kuznetsov, ulitsa Lermontova, 325, kv.36, all of Irkutsk; Gunar Izidorovich Zelchan, ulitsa Moskovskaya, 256/4, kv.11, Riga, and Valery Mikhailovich Dyakov, ulitsa Lermontova, 263, kv.23, Irkutsk, all of U.S.S.R.

Filed Aug. 15, 1975, Ser. No. 605,202

Int. Cl.[2] A61K *31/695*

U.S. Cl. 424—184 2 Claims

1. A method for healing wounds in patients which comprises topically administering to a patient in need of such treatment a wound-healing effective amount of a medicinal composition containing from 1 to 5% by weight of 1-(chloromethyl)silatrane of the formula



in a pharmaceutical carrier selected from the group consisting of lanolin-petroleum jelly and vegetable oil.

4,055,638

NOVEL COMPOUNDS, COMPOSITIONS CONTAINING SUCH COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND METHODS OF TREATMENT

Bertil Högberg; Hans Fex; Torsten Perklev; Sten Veige, all of Helsingborg, and Bo Fredholm, Nyhamnslage, all of Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

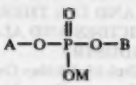
Division of Ser. No. 280,211, Aug. 14, 1972, Pat. No. 3,989,825. This application July 23, 1976, Ser. No. 708,187

Claims priority, application United Kingdom, Aug. 17, 1971, 38578/71; Jan. 31, 1972, 4510/72

Int. Cl.[2] C07F *9/09;* A01N *9/36*

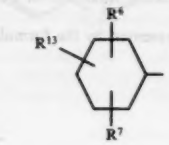
U.S. Cl. 424—219 20 Claims

1. A novel secondary phosphoric acid ester compound having the general formula

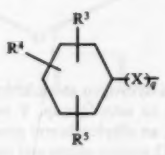


(I)

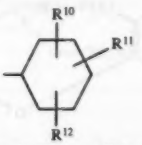
wherein M is selected from the group consisting of hydrogen and a pharmaceutically acceptable inorganic and organic cation, and wherein A and B, independent of each other, are



wherein one and only one of the substituents R^6, R^7, and R^{13} always represents a group R, located in any of the ortho, meta and para positions relative to the phosphoric acid ester group, the group R having the formula



wherein q is selected from the group consisting of zero and one, and wherein X is selected from the group consisting of: straight saturated hydrocarbon chains having at most 4 carbon atoms; and straight hydrocarbon chains having 2 to 4 carbon atoms and containing one double bond; wherein X above may be substituted by at most two substituents selected from the group consisting of; lower alkyl; cyclopentyl, cyclohexyl; phenyl; phenyl substituted in m- or p- position by one substituent selected from the group consisting of lower alkyl, —F, —Cl, and —Br; benzyl; and benzyl substituted in m- or p-position by one substituent selected from the group consisting of lower alkyl, —F, —Cl, and —Br, with the proviso that not more than one substituent selected from the group consisting of: cyclopentyl; cyclohexyl; phenyl; substituted phenyl; benzyl; and substituted benzyl is present in X; wherein B in the general formula (I) above also may be selected from the group consisting of: 1- and 2- naphthyl, both naphthyls being at most di-substituted; and



wherein the substituents in B, when B is naphthyl, are selected from the group consisting of lower alkyl, -F, -Cl, and -Br; wherein R^3, R^4, R^5, R^6, R^7, R^{10}, R^{11}, R^{12}, and R^{13} above are selected from the group consisting of: hydrogen; lower alkyl; —F; –Cl; and -Br; with the proviso that when B = A, resulting in symmetric secondary phosphoric acid esters, and q is zero, at least two of R^3, R^4, R^5, R^6, R^7, and R^{13} are substituents other than hydrogen.

2. A method of treating a living animal body suffering from the actions of an excessive formation and release of endogenous prostaglandin or exposure to exogenous prostaglandin comprising administration of a therapeutically effective amount of a compound of claim 1 to said animal body.

4,055,639

DERIVATIVES OF N-(2,2-DICHLOROVINYL) SALICYLAMIDE AND USE THEREOF AS BACTERICIDES, FUNGICIDES AND ALGICIDES FOR INDUSTRY

Kiyonobu Hirose, Ageo; Shuichi Ishida, Omiya, and Kaoru Omori, Okegawa, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

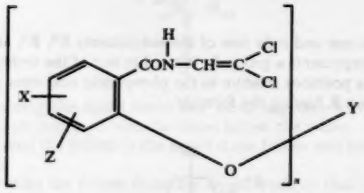
Filed July 14, 1975, Ser. No. 595,748

The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.

Int. Cl.[2] A01N *9/24;* A61L *31/60;* C07C *69/86*

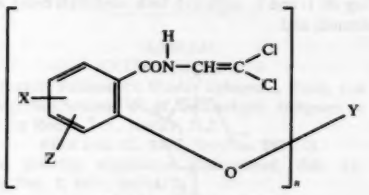
U.S. Cl. 424—230 9 Claims

1. A compound represented by the formula



wherein X represents hydrogen atom, chlorine atom, bromine atom, methyl group or nitro group, Y represents hydrogen atom, methyl group, an alkylcarbonyl group where the alkyl group has from 1 to 12 carbon atoms and may be substituted by one or more halogen atoms, a lower alkoxy carbonyl group, a lower alkylamino carbonyl group or a metal atom of which valence is 1 or 2, Z represents hydrogen atom or chlorine atom and *n* represents 2 when Y represents a metal atom of which valence is 2 and *n* represents 1 when Y does not represent a metal atom of which valence is 2, but when X and Z represent hydrogen atom, Y does not represent hydrogen atom or a metal atom.

4. A method for killing bacteria, fungi and algae comprising applying to industrial raw materials, industrial products and water in circular water systems an effective amount of one or more compounds of the formula



wherein X represents hydrogen atom, chlorine atom, bromine atom, methyl group or nitro group, Y represents hydrogen atom, methyl group, an alkylcarbonyl group where the alkyl group has from 1 to 12 carbon atoms and may be substituted by one or more halogen atoms, a lower alkylamino carbonyl group, a lower alkoxycarbonyl group, a lower alkylamino carbonyl group or a metal atom of which valence is 1 or 2, Z represents hydrogen atom or chlorine atom and *n* represents 2 when Y represents a metal atom of which valence is 2 and *n* represents 1 when Y does not represent a metal atom of which valence is 2, but when X and Z represent hydrogen atom, Y does not represent hydrogen atom or a metal atom.

4,055,640

COMPOSITIONS AND METHODS FOR CONTROLLING THE GROWTH OF BACTERIA, FUNGI AND ALGAE USING CERTAIN DERIVATIVES OF N-(2,2-DICHLOROVINYL)SALICYLAMIDES

Kiyonobu Hirose, Ageo; Shuichi Ishida, Omiya, and Kaoru Omori, Okegawa, all of Japan, assignors to Nippon Kayaku Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 595,748, July 14, 1975, and Ser. No. 595,749, July 14, 1975, abandoned. This application Jan. 15, 1976, Ser. No. 649,555

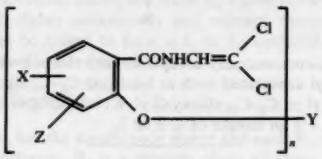
Claims priority, application Japan, Aug. 13, 1975, 50-97518; July 18, 1975, 50-88088

The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.

Int. Cl.[2] A01N *9/24;* A61L *31/60*

U.S. Cl. 424—230 8 Claims

1. The method for killing bacteria, fungi and algae comprising applying to materials vulnerable thereto an effective amount of one or more compounds of the formula



where X represents hydrogen atom, chlorine atom, bromine atom, methyl group or nitro group, Y represents hydrogen atom, methyl group, an alkylcarbonyl group where the alkyl group has from 1 to 12 carbon atoms, and may be substituted by one or more halogen atoms, a lower alkoxy carbonyl group, a lower alkylamino carbonyl group or a metal atom of which the valence is 1 or 2, Z represents hydrogen atom or chlorine atom and *n* represents 2 when Y represents a divalent metal and *n* represents 1 when Y does not represent a divalent metal.

4,055,641

METHOD OF TREATING BENIGN PROSTATIC HYPERTROPHY

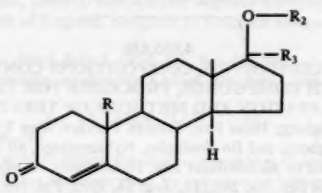
Harvey D. Benson, Cincinnati; Joyce Francis Grunwell, Hamilton; John O'Neal Johnston, Cincinnati, all of Ohio, and Vladimir Petrow, Chapel Hill, N.C., assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed May 10, 1976, Ser. No. 684,945

Int. Cl.[2] A61K *31/56*

U.S. Cl. 424—242 12 Claims

1. A method of treating benign prostatic hypertrophy in a patient in need thereof which comprises administering to said patient an effective amount of a compound of the formula:



wherein R is —CHO or —CH_2OR_1; each of R_1 and R_2 is hydrogen, alkylcarbonyl wherein the alkyl moiety has from 1 to 20 carbon atoms and is straight or branched, benzoyl, phenylalkylcarbonyl wherein the alkyl moiety has from 1 to 6 carbon atoms and is straight or branched or cycloalkylcarbonyl wherein the cycloalkyl moiety has from 5 to 10 carbon atoms;

R_3 is hydrogen; or R_2 and R_3 together form a double bond between the 17- position carbon atom and the oxygen atom.

4,055,642

IMIDAZOLYL-2-QUINAZOLINE DERIVATIVES

Hans Nesvadba, and Hellmuth Reinshagen, both of Vienna, Austria, assignors to Sandoz Ltd., Basel, Switzerland

Filed May 5, 1976, Ser. No. 683,291

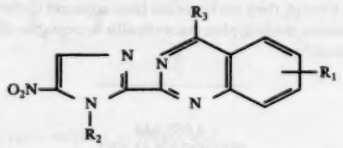
Claims priority, application Switzerland, May 12, 1975, 6041/75

Int. Cl.[2] A61K *31/505*; C07D *239/88, 239/93, 239/94*

U.S. Cl. 424—246 31 Claims

1. Compounds of formula I,

I



in which

R_1 is hydrogen, lower alkyl of 1 to 4 carbon atoms or halogen,

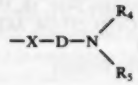
R_2 is lower alkyl of 1 to 6 carbon atoms, lower alkenyl of 2 to 6 carbon atoms or lower hydroxyalkyl of 1 to 6 carbon atoms,

and

R_3 is

a. a group of formula II,

II



in which

X is oxygen or sulphur,

D is straight or branched chain alkylene of 1 to 6 carbon atoms

and either

R_4 is hydrogen or lower alkyl of 1 to 4 carbon atoms

and

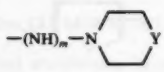
R_5 is lower alkyl of 1 to 4 carbon atoms or lower hydroxyalkyl of 1 to 4 carbon atoms

or

R_4 and R_5, together with the nitrogen atom to which they are attached, is piperidino or piperazino, unsubstituted or substituted by lower alkyl of 1 to 4 carbon atoms or lower hydroxyalkyl of 1 to 4 carbon atoms.

b. a group of formula III,

III



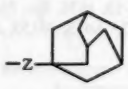
in which

m is 0 or 1, and

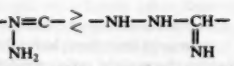
Y is oxygen or sulphur, or imino, unsubstituted or substituted by lower alkyl of 1 to 4 carbon atoms or lower hydroxyalkyl of 1 to 4 carbon atoms

c. a group of formula IV,

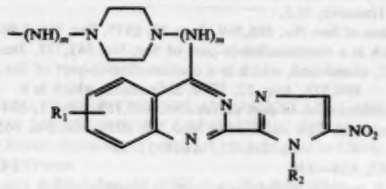
IV



in which

Z is —NH— or 

d. a group of formula V,



in which

m, R_1 and R_2 are as defined above, the *m*'s, the R_1's and the R_2's then being the same,

e. a group of formula VI,

VI

in which

Z is a defined above, and

either

A is oxygen or sulphur and B is —CH—,

or

A is sulphur or —N(R_6)—, in which R_6 is lower alkyl of 1 to 4 carbon atoms or lower hydroxyalkyl of 1 to 4 carbon atoms,

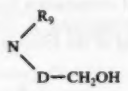
and

B is nitrogen,

or

f. a group of formula VII,

VII



in which

D is a defined above, and

R_9 is hydrogen, lower alkyl of 1 to 4 carbon atoms or lower hydroxyalkyl of 1 to 4 carbon atoms

and chemotherapeutically acceptable acid addition salts thereof.

7. A chemotherapeutic composition useful in treating parasitic disorders and inhibiting mycoplasma growth comprising a chemotherapeutically effective amount of compound of claim 1, in association with a chemotherapeutically acceptable diluent or carrier.

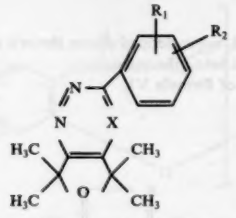
4,055,643

FURO(3,4-e)-AS-TRIAZINES AND CORRESPONDING 4-OXIDES AS SLEEP INDUCERS AND MINOR TRANQUILIZERS

Gregory B. Bennett, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 586,349, June 12, 1975, Pat. No. 3,963,713, which is a continuation-in-part of Ser. No. 541,721, Jan. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 496,578, Aug. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 465,759, May 1, 1974, abandoned. This application Mar. 10, 1976, Ser. No. 665,775
Int. Cl.[2] A61K *31/53*
U.S. Cl. 424—249 3 Claims

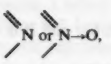
1. A method of inducing sleep in animals which comprises administering to an animal in need of such treatment a sleep-inducing effective amount of a compound of the formula



wherein

R_1 and R_2 each independently represent hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl, straight chain lower alkoxy, amino, nitro or trifluoromethyl, and

X represents



provided that

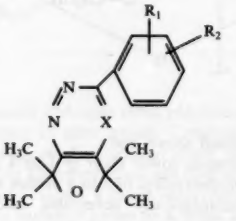
i. when one of R_1 and R_2 represents nitro, the other is other than nitro or trifluoromethyl;

ii. when R_1 and R_2 represent trifluoromethyl, they are on other than adjacent carbon atoms, and

iii. when R_1 and R_2 represent t-butyl, they are on other than adjacent carbon atoms, and

iv. when one of R_1 and R_2 is trifluoromethyl and the other is t-butyl, they are on other than adjacent carbon atoms.

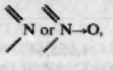
3. A pharmaceutical composition for use in treating tension or inducing sleep comprising a therapeutically effective amount of a compound of the formula



wherein

R_1 and R_2 each independently represent hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl, straight chain lower alkoxy, amino, nitro or trifluoromethyl, and

X represents



provided that

i. when one of R_1 and R_2 represents nitro, the other is other than nitro or trifluoromethyl;

ii. when R_1 and R_2 represent trifluoromethyl, they are on other than adjacent carbon atoms, and

iii. when R_1 and R_2 represent t-butyl, they are on other than adjacent carbon atoms, and

iv. when one of R_1 and R_2 is trifluoromethyl and the other is t-butyl, they are on other than adjacent carbon atoms,

in association with a pharmaceutically acceptable diluent or carrier therefor.

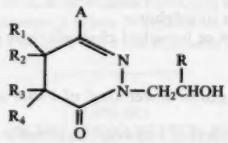
4,055,644

HYDROXYALKYL SUBSTITUTED-4,5-DIHYDROPYRIDAZIN(2H)-3-ONES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 409,653, Oct. 25, 1973, Pat. No. 3,931,176, which is a continuation-in-part of Ser. No. 366,670, June 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 182,159, Sept. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 166,565, July 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 88,976, Nov. 20, 1970, abandoned. This application Sept. 18, 1975, Ser. No. 614,539
Int. Cl.[2] C07D *237/04;* A61K *31/50*
U.S. Cl. 260—250 AH 4 Claims

1. A compound of the formula



where

R is lower alkyl having 1 or 4 carbon atoms,

R_1, R_2, R_3 and R_4 each independently represent hydrogen or lower alkyl having 1 to 4 carbon atoms, and represents

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4,055,645

NOVEL ANTI-HYPERTENSIVE COMPOSITIONS

Alexander Scriabine, Ambler, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 13, 1976, Ser. No. 657,825
Int. Cl.[2] A61K *31/50, 31/15*
U.S. Cl. 424—250 5 Claims

1. A pharmaceutical composition for treating hypertension comprising effective amounts of

a. hydralazine or a pharmaceutically acceptable salt thereof and

b. racemic mixture or L-isomer of a hydrazino phenyl propionic acid decarboxylase inhibitor,

wherein the weight ratio of (a):(b) is 1:1 to about 1:1000.

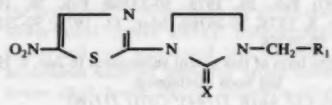
4,055,646
1-(5-NITROTHIAZOLYL-2)-3-(PIPERAZINOMETHYL)-IMIDAZOLIDINONES-2 AND CORRESPONDING IMINO AND THIONES

Gerd Ascher, and Hellmuth Reinshagen, both of Vienna, Austria, assignors to Sandoz Ltd., Basel, Switzerland

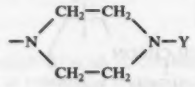
Filed Feb. 6, 1976, Ser. No. 655,729
Claims priority, application Switzerland, Feb. 13, 1975, 1773/75
Int. Cl.[2] C07D *417/14;* A61K *31/495*
U.S. Cl. 424—250 9 Claims

1. A compound of formula I,

I



in which
X is oxygen, sulphur or imino, and
R_1 is



wherein *y* is alkyl of 1 to 4 carbon atoms or monohydroxy alkyl of 1 to 4 carbon atoms, or chemotherapeutically acceptable acid additiion salts thereof.

6. A chemotherapeutic composition consisting essentially of a compoound of claim 1 in association with a chemotherapeutically acceptable diluent or carrier.

7. A method of treating schistosomiasis, trichomoiasis or coccidiosis or of inhibiting bacterial growth, consisting essentially of administering to a subject in need of such treatment an effective amount of a compound of claim 1.

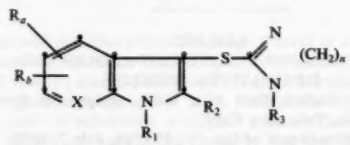
4,055,647
CONDENSED PYRROLE MERCAPTO COMPOUNDS HAVING HYPOTENSIVE AND DECONGESTANT PROPERTIES

Vishwa Prakash Arya, and Kuppuswamy Nagarajan, both of Bombay, India, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 478,197, June 11, 1974, Pat. No. 3,954,757.
This application Dec. 19, 1975, Ser. No. 642,503
Claims priority, application Switzerland, June 14, 1973, 8609/73
Int. Cl.[2] A61K *31/505*
U.S. Cl. 424—251 3 Claims

1. A pharmaceutical composition having vasoconstrictor and blood pressure lowering properties comprising a therapeutically effective amount of a compound of formula Ia

Ia



wherein X is nitrogen or the group CH, and each of R_a and R_b is hydrogen, lower alkyl, halogen or a lower alkoxy group, each of R_1 and R_3 independently is hydrogen or a lower alkyl group, R_2 is hydrogen, lower alkyl, a free carboxy group of a methoxy- or ethoxycarbonyl group and *n* is an integer denoting 2–4, or its tautomers or acid addition salts together with a pharmaceutically acceptable carrier.

4,055,648
PAPAVERINE THIENYL-CARBOXYLATES AND MEDICAMENTS CONTAINING THEM

Edgar Sache, Bures-sur-Yvette, France, assignor to Choay S.A., Paris, France

Filed Jan. 15, 1975, Ser. No. 541,279
Claims priority, application France, Jan. 16, 1974, 74.01460
Int. Cl.[2] A61K *31/485;* C07D *217/20*
U.S. Cl. 424—260 18 Claims

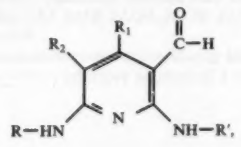
1. The papaverine compounds selected from the group consisting of: papaverine thienyl-2-carboxylate and papaverine thienyl-3-carboxylate.

4,055,649
4-ALKYL-2,6-DI-(SECONDARY OR TERTIARY ALKYL)AMINO-3-FORMYLPYRIDINES PHARMACEUTICAL COMPOSITIONS THEREOF AND THEIR USE IN THE TREATMENT OF OBESITY AND DIABETES

William R. Simpson, Mendham, and Robert J. Strohschein, Parsippany, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

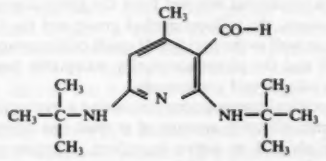
Filed Feb. 5, 1976, Ser. No. 655,428
Int. Cl.[2] A61K *31/44;* C07D *213/74*
U.S. Cl. 424—263 18 Claims

1. A compound of the formula



wherein
R is secondary alkyl of 3 to 7 carbon atoms or tertiary alkyl of 4 to 7 carbon atoms,
R' is secondary alkyl of 3 to 7 carbon atoms or tertiary alkyl of 4 to 7 carbon atoms,
R_1 is primary or secondary alkyl of 1 to 5 carbon atoms, and
R_2 is hydrogen, chloro or bromo,
or a pharmaceutically acceptable acid addition salt thereof.

7. A pharmaceutical composition comprising an effective amount of a compound according to claim 1, or a pharmaceutically acceptable acid addition salt thereof, and a pharmaceutically acceptable carrier, said amount being an amount effective for the treatment of obesity or diabetes.

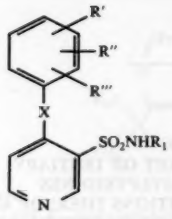


4,055,650
CERTAIN 4-PHENOXY(OR PHENYLTHIO)-3-N-ACYLATED-SULFONAMIDO-PYRIDINES

Jacques E. Delarge, Dolembreux; Charles L. Lapiere, Tongeren, and Andre H. Georges, Ottignies, all of Belgium, assignors to A. Christiaens Societe Anonyme, Brussels, Belgium

Continuation-in-part of Ser. No. 568,759, April 16, 1975, Pat. No. 4,018,929. This application June 9, 1976, Ser. No. 694,421
Claims priority, application United Kingdom, Apr. 17, 1974, 16836/74
Int. Cl.[2] C07D *213/71;* A61K *31/44*
U.S. Cl. 424—263 6 Claims

1. A compound of the following structure:



(I)

in which X represents an oxy or thio group; R_1 represents a group of the formula:

(II)

wherein R_3 represents a C_1–C_4-alkyl, cyclohexyl, unsubstituted phenyl or substituted phenyl group, or R_1 represents a group of the formula:

(III)

wherein R_4 represents a C_1–C_4-alkyl group or an unsubstituted or substituted phenyl group; R′, R″ and R‴ represent each hydrogen or a substituent selected from the group comprising the halogen atoms, the trifluoromethyl group and the C_1–C_4-alkyl groups, as well as the pyridine N-oxide of the compounds of Formula I and the pharmaceutically acceptable base and acid addition salts of said compounds.

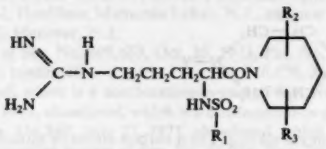
6. Pharmaceutical compositions containing a hypo-uricemic or hypo-lipemic effective amount of at least one compound according to claim 1 as active ingredient, together with a pharmaceutical carrier or vehicle.

4,055,651
N²-ALKOXYNAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, Kobe; Ryoji Kikumoto; Kazuo Ohkubo, both of Tokyo; Tohru Tezuka, Yokohama; Shinji Tonomura, Tokyo; Yoshikuni Tamao, Yokohama, and Akiko Hijikata, Kobe, all of Japan, assignors to Mitsubishi Chemical Industries Ltd. and Shosuke Okamoto, both of, Japan

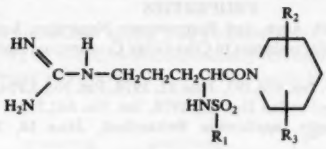
Continuation-in-part of Ser. No. 671,436, March 29, 1976, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jan. 28, 1976, Ser. No. 653,217
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-23268; Feb. 26, 1975, 50-23635; Mar. 5, 1975, 50-26768; Mar. 11, 1975, 50-29357; Mar. 11, 1975, 50-29358
The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.
Int. Cl.[2] A61K *31/445;* C07D *211/60*
U.S. Cl. 424—267 12 Claims

1. An N²-alkoxynaphthalenesulfonyl-L-argininamide having the formula:



and the pharmaceutically acceptable salts thereof, wherein R_1 is naphthyl substituted with at least one C_1 – C_5 alkoxy; R_2 is hydrogen or C_1 – C_{10} alkyl; R_3 is — $COOR_4$ wherein R_4 is selected from the group consisting of hydrogen, C_1 – C_{10} alkyl, C_6 – C_{10} aryl and C_7 – C_{12} aralkyl; R_2 can be substituted at the 2, 3, 4, 5 or 6 — position; and R_3 is substituted at the 2 or 3 — position.

12. A method for inhibiting activity and suppressing activation of thrombin in vivo, which comprises administering to a patient a pharmceutically effective amount of an N²-alkoxynaphthalenesulfonyl-L-argininamide having the formula:



(I)

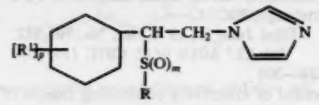
or the pharmaceutically acceptable salts thereof, wherein R_1 is naphthyl substituted with at least one C_1 – C_5 alkoxy; R_2 is hydrogen or C_1 – C_{10} alkyl; R_3 is —$COOR_4$ wherein R_4 is selected from the grou consisting of hydrogen, C_1 – C_{10} alkyl, C_6 – C_{10} aryl and C_7 – C_{12} aralkyl; R_2 can be substituted at the 2, 3, 4, 5 or 6 — position; and R_3 is substituted at the 2 or 3 position.

4,055,652
1-[β(R-THIO)PHENETHYL]IMIDAZOLES AND DERIVATIVES THEREOF

Keith A. M. Walker, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 593,620, July 7, 1975, abandoned, which is a continuation-in-part of Ser. No. 508,384, Sept. 23, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,453
Int. Cl.[2] C07D *233/60;* A61K *31/415*
U.S. Cl. 424—273 R 46 Claims

1. A compound of the formula:



(I)

and the antimicrobial acid addition salts thereof, wherein:

R is alkyl, alkenyl, aralkenyl, substituted aralkenyl, alkynyl, cycloalkyl, cycloalkyl alkyl, aralkyl, substituted aralkyl, aryl or substituted aryl, said substituted aralkenyl and substituted aralkyl containing at least one substituent on the aryl moiety selected from the group consisting of halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro and cyano and said substituted aryl containing at least one substituent selected from the group consisting of halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro, amino alkanoylamino and cyano;

R^1 is hydrogen, halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro, cyano, thiocyano or the group

in which R^2 is alkyl, cycloalkyl, aralkyl, substituted aralkyl, aryl or substituted aryl, and substituted aralkyl and said substituted aryl containing at least one substituent on the aryl moiety selected from the group consisting of halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro and cyano;

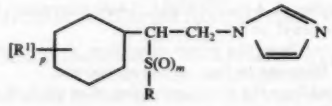
and wherein with reference to the above, alkyl has 1 to 20 carbon atoms, cycloalkyl has 5 to 8 carbon atoms, cycloalkyl has 6 to 11 carbon atoms, alkenyl and alkynyl have 2 to 12 carbon atoms, aryl has 6 to 10 carbon atoms, aralkyl has 7 to 14 carbon atoms, aralkenyl has 8 to 14 carbon atoms, lower alkyl and lower alkoxy have 1 to 6 carbon atoms and alkanoylamino has 2 to 12 carbon atoms;

m, n and p are independently selected from the integers zero, 1 and 2;

provided that the value of m cannot be greater than the value of n except when R^1 is the group

and R^2 is aryl or substituted aryl.

44. A method of inhibiting the growth of fungi, bacteria or protozoa which comprises applying to a host object containing, or subject to attack by fungi, bacteria or protozoa, an effective amount of a compound of the formula



(I)

or an antimicrobial acid addition salt thereof or a composition containing same as an active ingredient, wherein:

R is alkyl, alkenyl, aralkenyl, substituted aralkenyl, alkynyl cycloalkyl, cycloalkyl alkyl, aralkyl, substituted aralkyl, aryl or substituted aryl, said substituted aralkenyl and substituted aralkyl containing at least one substituent on the aryl moiety selected from the group consisting of halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro and cyano and said substituted aryl containing at least one substituent selected from the group consisting of halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro, amino alkanoylamino and cyano;

R^1 is hydrogen, halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro, cyano, thiocyano or the group

in which R^2 is alkyl, cycloalkyl, aralkyl, substituted aralkyl, aryl or substituted aryl, said substituted aralkyl and said substituted aryl containing at least one substituent on the aryl moiety selected from the group consisting of halo, lower alkyl, lower alkoxy, trifluoromethyl, nitro and cyano;

and wherein with reference to the above, alkyl has 1 to 20 carbon atoms, cycloalkyl has 5 to 8 carbon atoms, cycloalkyl alkyl has 6 to 11 carbon atoms, alkenyl and alkynyl have 2 to 12 carbon atoms, aralkyl has 7 to 14 carbon atoms, aralkenyl has 8 to 14 carbon atoms, lower alkyl and alkoxy have 1 to 6 carbon atoms and alkanoylamino has 2 to 12 carbon atoms;

m, n and p are independently selected from the integers zero, 1 and 2;

provided that the value of m cannot be greater than the value of n except when R^1 is the group

and R^2 is aryl or substituted aryl.

4,055,653

SULFUR CONTAINING TRIALKOXYBENZOYLAMINO CARBOXYLIC ACIDS

Heribert Offermanns, Grossauheim, and Klaus Posselt, Wachtberg-Villiprott, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

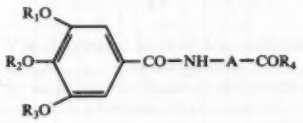
Continuation-in-part of Ser. No. 468,087, May 8, 1974, Pat. No. 3,981,910. This application May 18, 1976, Ser. No. 687,504

Claims priority, application Austria, May 15, 1973, 4232/73

Int. Cl.[2] A61K *31/24, 31/38, 31/195*

U.S. Cl. 424—275 **46 Claims**

1. A pharmaceutical composition having antiischemic activity comprising (1) an effective amount of a compound of the formula;



I

wherein:

A is alkylidene having 2 to 5 carbon atoms and which is substituted by alkyl thio having 1 to 4 carbon atoms, carboxymethyl thio group, carboxyethyl thio, alkylsulfonyl having 1 to 4 carbon atoms, or mercapto, or the substituent on A together with $—COR_4$ forms a 4 to 7 membered thiolactone ring, or A is substituted by an acylmercapto wherein the acyl is benzoyl, benzoyl substituted with one, two or three alkoxy groups with 1 to 6 carbon atoms, alkanoyl of one to six carbon atoms, alkenoyl of 3 to 6 carbon atoms, at least two of R_1, and R_2 and R_3 are alkyl of 1 to 5 carbon atoms and the other R_1, R_2 and R_3 is alkyl of 1 to 5 carbon atoms, hydrogen or the acyl of alkanoic acid of 2 to 4 carbon atoms and R_4 is hydroxy or alkoxy with 1 to 5 carbon atoms and their pharmaceutically acceptable salts and (2) a pharmaceutically acceptable adjuvant.

4,055,654

6,8-DI-T-BUTYL-4-OXO-4H-1-BENZOPYRAN-2-CARBOXYLIC ACID AND DERIVATIVE FOR THE PREVENTION OF ASTHMATIC SYMPTOMS

Hugh Cairns; Albert Chambers, and Thomas Brian Lee, all of Loughborough, England, assignors to Fisons Limited, England

Division of Ser. No. 382,642, July 26, 1973, Pat. No. 3,952,104, which is a division of Ser. No. 172,214, Aug. 16, 1971, Pat. No. 3,786,071. This application Jan. 2, 1976, Ser. No. 646,025

Claims priority, application United Kingdom, Aug. 25, 1970, 40777/70; Sept. 15, 1970, 43984/70; Dec. 11, 1970, 58860/70; June 3, 1971, 18807/71

The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.

Int. Cl.[2] A61K *31/35*

U.S. Cl. 424—283 4 Claims

1. A composition useful for the prevention of asthmatic symptoms comprising an amount useful for the prevention of asthmatic symptoms of 6,8-di-t-butyl-4-oxo-4-H-1-benzopyran-2-carboxylic acid or a pharmaceutically acceptable salt, lower alkyl ester, ester with a di-lower alkylamine substituted lower alkanol, bis ester with a di-(hydroxy lower alkyl) ether or unsubstituted amide thereof, as active ingredient, in combination with a pharmaceutically acceptable carrier.

4,055,655

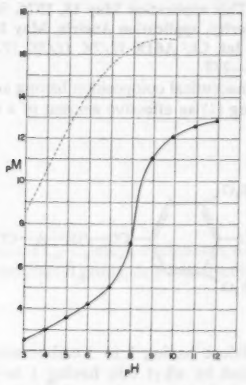
COMPLEXES OF HEAVY METAL IONS AND POLYFUNCTIONAL ORGANIC LIGANDS USED AS ANTIMICROBIAL AGENTS

Gerald L. Maurer, Fairfield, and Sudhir K. Shringarpurey, Cincinnati, both of Ohio, assignors to National Research Laboratories, Cincinnati, Ohio

Filed July 21, 1975, Ser. No. 597,756

Int. Cl.[2] A01N *9/00*

U.S. Cl. 424—294 14 Claims



1. A method of controlling microbes in a medium cnducive to microbial growth which comprises contacting said microbes or said medium with an effective antimicrobial amount of a metal complex of a heavy metal ion and a polyfunctional organic ligand in a ratio of 1:1 of the metal ion to the ligand, said ligand selected from the group consisting of an organic acid and a substituted organic acid, said complex having an aqueous proton induced dissociation property represented by a sigmodially-shaped curve on a cartesian coordinate plot of the negative log of the metal ion concentration versus the negative log of the hydrogen ion concentration, said dissociation property causing the controlled release of metal ions at a pH compatible with the viability of microbes in said medium.

4,055,656

METHOD OF CONTROLLING PEA APHIDS

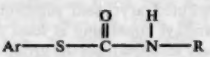
Jay Kent Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 30, 1976, Ser. No. 701,382

Int. Cl.[2] A01N *9/12*; C07C *155/00*

U.S. Cl. 424—300 4 Claims

1. A method of effectively controlling insects of the genus Acrythosiphum, which comprises bringing the insects into contact with an effective amount to effectively control said insect of a composition represented by the general formula:



wherein:

Ar is an aryl selected from the group consisting of: 4-chlorophenyl, 4-nitrophenyl, 2-chlorophenyl, 4-bromophenyl, 4-fluorophenyl, 3,4-dichlorophenyl, 3,4-dibromophenyl, 3,4-xylyl, 3-alkylphenyl in which the alkyl has from one to four carbon atoms, 4-alkylphenyl in which the alkyl has from one to four carbon atoms, 3-alkoxyphenyl in which the alkoxy has from one to four carbon atoms, 4-alkoxyphenyl in which the alkoxy has from one to four carbon atoms, 3-alkylthiophenyl in which the alkylthio has from one to four carbon atoms, and 4-alkylthiophenyl in which the alkylthio has from one to four carbon atoms; and

R is a cycloalkyl selected from the group consisting of cyclopropyl, 2-methylcyclopropyl, cyclobutyl, cyclopentyl, 2-methylcyclopentyl and cyclohexyl.

4,055,657

METHODS FOR CONTROLLING FUNGI

Jay K. Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

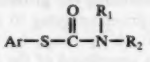
Filed July 6, 1976, Ser. No. 702,563

Int. Cl.[2] A01N *9/12*; C07C *155/00*

U.S. Cl. 424—300 13 Claims

1. A method of controlling the deleterious effects of a fungus selected from the group consisting of Phytophthorans and *Pythium ultimum* which comprises:

contacting the fungus with an effective amount of a compound to control the deleterious effects of said fungus, said compound having a general formula:



wherein:

Ar is selected from the group consisting of 4-nitrophenyl, 4-bromophenyl, 4-fluorophenyl, 3,4-dichlorophenyl, 3,4-dibromophenyl, and 2-chlorophenyl;

R_1 is selected from the group consisting of hydrogen, an alkyl of from one to four carbon atoms; and

R_2 is selected from the group consisting of an alkyl of one to four carbon atoms.

4,055,658

CYANOMETHYLPHENETHANOLAMINES

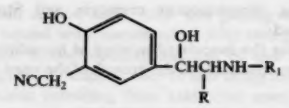
William E. Kreighbaum; William L. Matier, and Herbert R. Roth, all of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed May 17, 1976, Ser. No. 687,435

Int. Cl.[2] A61K *31/275*; C07C *121/80*

U.S. Cl. 424—304 10 Claims

1. A compound selected from the group of phenethanolamines of the formula



or a pharmaceutically acceptable acid addition salt thereof wherein

R is hydrogen, methyl or ethyl;

R_1 is hydrogen or a radical selected from the group consisting of straight or branched chain lower alkyl of 1 to 6 carbon atoms inclusive, straight or branched chain lower alkyl of 1 to 6 carbon atoms substituted by phenyl, phenoxy, substituted phenyl or substituted phenoxy wherein said phenyl or phenoxy substituent is hydroxy, methoxy, or halogen.

4,055,659

RETINOIC ACID DERIVATIVES

Robert J. Gander, Whitehouse, and John A. Gurney, East Brunswick, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Nov. 3, 1975, Ser. No. 628,185
Int. Cl.[2] A61K *31/215*; C09F *5/00*
U.S. Cl. 424—305 **9 Claims**

1. All trans-retinoyloxyacetamide.

2. A pharmaceutical composition for the treatment of acne by topical application which comprises an effective acne-treatment amount of all-trans-retionoyloxyacetamide admixed with a pharmaceutically-acceptable vehicle.

4,055,660

TREATMENT FOR WARTS

Dwight W. Meierhenry, 738 E. Sahara Ave., Las Vegas, Nev. 89104

Continuation-in-part of Ser. No. 483,681, June 26, 1974, abandoned. This application July 12, 1976, Ser. No. 704,285
Int. Cl.[2] A61K *31/245*
U.S. Cl. 424—310 **4 Claims**

1. A method of treating warts causing their remission which consists of injecting directly into the wart, under pressure, until at least part of the wart structure is physically destroyed and bleeding occurs, from about 0.5 to about 5 cc's of an aqueous solution comprising from about 0.1% to about 10% by weight of procaine, and allowing the treated wart to remain in place without surgical treatment for at least two weeks.

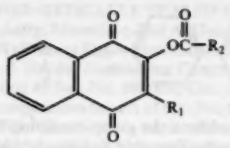
4,055,661

MITICIDAL AND APHICIDAL METHOD UTILIZING 2-HIGHER ALKYL-3-HYDROXY-1,4-NAPHTHOQUINONE CARBOXYLIC ACID ESTERS

Russell Frank Bellina, and Dennis Lynn Fost, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 531,483, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 494,294, Aug. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 468,692, May 10, 1974, abandoned. This application Sept. 15, 1975, Ser. No. 613,553
Int. Cl.[2] A01N *9/24*
U.S. Cl. 424—311 **14 Claims**

1. A method for protecting plants from mites or aphids comprising applying to the plant locus to be protected a miticidally or aphicidally effective amount of a compound of the formula:



I

wherein

R_1 is alkyl of 8–14 carbon atoms which are branched, cyclic, or straight chain and

R_2 is alkyl of 1–6 carbon atoms either branched or straight chain, $—CH_2OCH_3$ or $—CH_2OCH_2CH_3$.

4,055,662

ANTIMICROBIAL COMPOSITION CONTAINING 10-UNDECENSIC ACID ISOPROPYLIC ESTER

Rudolf Kürner, P.O. Box 1763, 638 Bad Homburg vor der Hohe, Germany

Filed Oct. 3, 1975, Ser. No. 619,507
Claims priority, application Germany, Oct. 5, 1974, 2447627
Int. Cl.[2] A01N *9/24*
U.S. Cl. 424—312 **3 Claims**

1. A method for the treatment of a fungal disease of the skin which comprises topical administration to the afflicted skin of a host of an amount of 10-undecenoic acid isopropylic ester which is therapeutically effective for the treatment thereof.

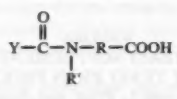
4,055,663

HALOGENATED ACYLAMINO ACIDS AS FUNGICIDES

Sol J. Barer, Plainsboro; Peter C. Valenti, East Windsor, and Michael Marchwinski, N. Brunswick, all of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Filed June 27, 1974, Ser. No. 483,579
Int. Cl.[2] A01N *9/20*
U.S. Cl. 424—319 **13 Claims**

1. A method of destroying fungi comprising applying to the fungi a fungicidally effective amount of a compound of the formula



wherein Y is chlorinated alkyl of 1 to 6 carbon atoms, R is C_nH_{2n} or $R_2C_nH_{2n-1}$, n is an integer from 1 to 11, R_2 is phenylalkyl of up to 10 carbon atoms or carboxyalkyl of up to 5 carbon atoms, R^1 is hydrogen, alkyl, haloalkyl of 1 to 4 carbon atoms, phenyl or alkylphenyl of up to 10 carbon atoms, or a salt thereof.

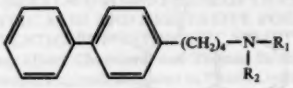
4,055,664

PHARMACEUTICAL PREPARATIONS CONTAINING 4-(4-BIPHENYLYL) BUTYLAMINES AND TREATMENT OF THE ANIMAL ORGANISM THEREWITH

Martin O. Skibbe, Kankakee, Ill., assignor to Armour Pharmaceutical Company, Phoenix, Ariz.

Division of Ser. No. 548,717, Feb. 10, 1975, abandoned. This application Sept. 23, 1976, Ser. No. 726,081
Int. Cl.[2] A61K *31/135*
U.S. Cl. 424—330 **15 Claims**

8. The method of treating an inflammatory condition of a host, including man, comprising administering to said host daily from about 1 mg. to about 2,000 mg. of a compound having the structure



wherein: R_1 is selected from the group consisting of hydrogen and a lower alkyl having from one to four carbon atoms; and R_2 is selected from the group consisting of hydrogen, and a lower alkyl having from one to four carbon atoms.

4,055,665

TREATING ARRYTHMIA WITH PHENYLTHIOARALKYLAMINES

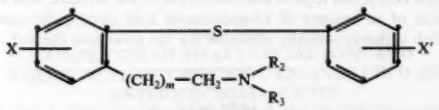
Marcia Elizabeth Christy, Perkasie, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 526,984, Nov. 25, 1974, Pat. No. 4,018,830, which is a continuation-in-part of Ser. No. 860,076, Sept. 22, 1969, abandoned. This application Apr. 12, 1976, Ser. No. 675,651

Int. Cl.[2] A61K *31/135, 31/54, 31/535, 31/495*

U.S. Cl. 424—330 **3 Claims**

1. Method of treating animals suffering from arrythmia which comprises orally or parenterally administering an antiarrythmia amount of compound having the formula



wherein

R_2 and R_3 are independently selected from the group consisting of hydrogen C_1–C_6 alkyl, benzyl, phenethyl, C_2–C_6 alkenyl and C_2–C_6 alkynyl;

X and X' are selected from the group consisting of hydrogen, halogen, C_1–C_6 alkyl, C_1–C_5 alkoxy, and trifluoromethyl; and

m is an integer selected from the group consisting of 0 to 4 inclusive and non-toxic, pharmacologically acceptable salts thereof.

4,055,666

ANIMAL FEED YEAST SUPPLEMENT FROM DRIED WHEY YEAST BRAN PROCESS

George A. Jeffreys; Jean L. Price, and James F. Tobey, all of Salem, Va., assignors to George A. Jeffreys & Co., Inc., Salem, Va.

Filed May 24, 1976, Ser. No. 689,158

Int. Cl.[2] A12K *1/08*

U.S. Cl. 426—31 **6 Claims**

1. A process for producing an animal feed supplement by growing a yeast that utilizes lactose, which comprises the steps of

a. preparing a solid substrate mixture composed of bran husks supplemented with essential nutrients, and 10 to 21% dried whey typically containing 65 to 75% lactose;

b. moistening said mixture to bring the water-substrate ratio within the range of 50/100 to 70/100, thereby providing a semi-solid substrate;

c. pasteurizing the moistened mixture and then cooling it to at least 100° F;

d. inoculating the cooled mixture with a lactose utilizing yeast selected from a group consisting of *Kluveromyces fragilis, Kluveromyces lactis, Torulopsis cremoris* and *Torulopsis spherica;*

e. said lactose utilizing yeast being mixed with a lactic culture selected from a group consisting of Lactobacillus acidophilus, Lactobacillus bulgaricus, Lactobacillus thermophilus, Streptococcus cremoris, and Streptococcus lactis, and

f. incubating the inoculated mixture at humidities and temperatures conducive to the growth of the yeast for 12 to 24 hours.

4,055,667

ANIMAL FEEDS

John H. Linton; William J. Esdale, both of Beaconsfield, and John Viscount Cross, Saskatoon, all of Canada, assignors to Ogilvie Mills Ltd., Montreal, Canada

Filed Dec. 3, 1975, Ser. No. 637,129

Int. Cl.[2] C12C *11/18*

U.S. Cl. 426—62 **17 Claims**

1. A liquid animal feed supplement comprising a colloidal mixture having a pH below 5, and a solids content of from 30 to 50% by weight suspended in a colloidal suspension of spent brewers' yeast in an aqueous alcoholic medium and an effective amount of at least one water dispersible water-binding agent, said spent brewers'yeast having a majority of said suspended solids, said supplement being pumpable, having a viscosity of from 250 to 7000 cps at 23° C. and a flow rate of less than 5 minutes and more than 11 seconds at 20° C., and said supplement being further characterized by being gravitationally stable.

4,055,668

INFUSION PACKAGE

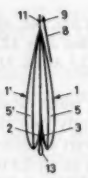
Georg Kopp, Neuhausen am Rheinfall, Switzerland, assignor to S I G Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Mar. 18, 1976, Ser. No. 668,077

Claims priority, application Switzerland, Mar. 25, 1975, 3814/75

Int. Cl.[2] B65B *29/04*

U.S. Cl. 426—79 **4 Claims**



1. An infusion package including a first and a second bag joined to one another along a common first seam and being arranged in a face-to-face relationship by folding the bags onto one another along a fold line extending in the first seam and dividing the first seam into face-to-face arranged longitudinal halves; each bag having a free edge opposite the first seam; a second seam extending along the free edge of the first bag; a third seam extending along the free edge of the second bag; the second and the third seam being in a face-to-face relationship and being secured to one another; and a holder string positioned between the two bags; the holder string having a first end attached to one of the bags and a second end attached to a tag; the improvement comprising means defining a first and a second opening in said first and said second seam, respectively; said first end of said holder string being affixed to said third seam; said holder string extending between said first and second bags looplessly to said first opening from its attachment to said third seam; said holder string being glidably threaded twice through said first opening to form a string loop oriented externally of said bags; said holder string further extending between said first and second bags looplessly to said second opening from said first opening; said holder string being glidably threaded, adjacent its said second end, through said second opening; said tag being arranged externally of said bags

adjacent said second seam, such that pulling said tag away from said second seam causes said holder string to be pulled through said second opening and out of said first opening under the gradual disappearance of said string loop and holder string portions extending from said third seam to said first opening and from said first opening to said second opening.

4,055,669

FOOD BAR AND PROCESS OF PREPARING SAME

Ray G. Kelly, Kirkwood; Kenneth R. Pruitt, Sr., Arnold, and Alvin L. Kershman, Bridgeton, all of Mo., assignors to Sunmark, Inc., St. Louis, Mo.

Continuation of Ser. No. 367,115, June 4, 1973, abandoned. This application June 16, 1975, Ser. No. 586,970
(under 37 CFR 1.47)
Int. Cl.² A23L *1/34*
U.S. Cl. 426—93 23 Claims

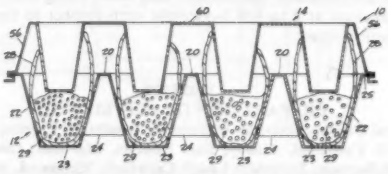
1. A food bar comprising particles of cereal bound together with an edible solid particulate adhesive food composition comprising a particulate protein source in a proportion sufficient that said composition contains at least about 15% by weight protein, between about 33% and about 85% by weight of edible fat, said fat being substantially solid at room temperature but becoming a smooth fluid at mouth temperature, and up to about 52% by weight of a carbohydrate selected from the group consisting of monosaccharides and disacchrides, the individual particles of said protein source and carbohydrate being substantially coated with said fat so as to mask flavors arising from said protein.

4,055,670

PACKAGE FOR STORING AND TRANSPORTING TORTILLAS OR TACOS

Edward Bruce Belmont, Winston-Salem, N.C., assignor to RJR Foods, Inc., Winston-Salem, N.C.

Filed Sept. 30, 1976, Ser. No. 728,092
Int. Cl.² B65B *23/00*
U.S. Cl. 426—119 14 Claims



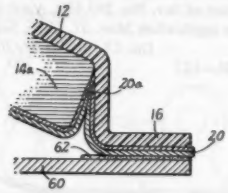
1. A package of U-shaped tortilla shells comprising:
a. a tray means containing said tortilla shells with the fold zone of said shell within the tray, said shell opening upwardly;
b. a lid means covering said tray means for enclosing said tortilla shells; and
c. spacer means for insertion into the open end of each of said shells, whereby the sides of the shells are prevented from collapsing and the opening is maintained, said tortilla shells being out of contact with each other.

4,055,671

HERMETICALLY SEALED PACKAGE

Reid A. Mahaffy, Montclair; Joel A. Hamilton, Englewood, and Wesley W. Pinney, Upper Montclair, all of N.J., assignors to Mahaffy & Harder Engineering Company, Totowa, N.J.

Continuation of Ser. No. 295,134, Oct. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 64,035, July 22, 1970, Pat. No. 3,709,702, which is a continuation of Ser. No. 484,284, Sept. 1, 1965, abandoned. This application July 21, 1975, Ser. No. 597,883
The portion of the term of this patent subsequent to Jan. 9, 1990, has been disclaimed.
Int. Cl.² B65D *5/64, 85/72*
U.S. Cl. 426—123 1 Claim



1. A hermetically sealed and evacuated package assembly comprising a cup-shaped container holding a perishable food product and having side walls with a continuous planar peripheral flange around its opening, said container member being made of semi-rigid gas-impermeable plastic material adapted to provide mechanical protection for the contained food product, the upper surfaces of said product being below the flange of the container member at least in the region adjacent the container side walls when said semi-rigid container is positioned with said opening facing upwards:
a stiff planar protective member secured to said container member in position parallel to and covering said opening a short distance from the adjacent surfaces of said product, said protective member defining a gas-permeable bottom element for the package when the semi-rigid container serves as the protective top element in the normal upright position of the completed package assembly, said bottom element acting as a base providing physical support and protection for the remaining food product after the package assembly has been opened for removal of a portion of the food product and then has been reclosed; and
a sheet of flexible stretchable gas-impermeable material disposed over said opening, between said container member and said protective member, to serve as a closure member for the package, said sheet being sealed to the flange of said container member around the periphery of said opening to cooperate with said container member in hermetically sealing said package from outside atmosphere, said sheet material being substantially thinner than said semi-rigid material and incapable of providing substantial mechanical protection for the contained product, said sheet material being sufficiently flexible that it is of nonform-retaining characteristic, said flexible material immediately adjacent said flanges comprising preformed portions shaped by stretching prior to package evacuation to extend into said container along the side walls thereof, said preformed portions being held by atmospheric pressure in tight and intimate form-fitting engagement with said product and said side walls, the portions of said flexible material which are held against said product being spaced from said protective member, the stretching of said flexible material being carried to a permanent-set dimension sufficient to avoid distortion of said semi-rigid container due to the force of atmospheric pressure on said flexible material;
said flexible sheet having a part thereof which extends out

beyond the peripheral edge of said container member flange to provide for manipulation of said extending part to permit said closure member to be at least partially disengaged from said container member to gain access to the enclosed food product; and

means providing for reclosure of said protective member and said container member with said protective member means secured to said container member to hold a remaining part of the product.

4,055,672

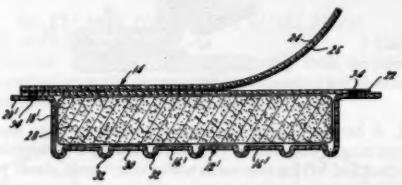
CONTROLLED ATMOSPHERE PACKAGE

Arthur Hirsch, Elizabeth; Francis X. Spiegel, Cedar Grove, both of N.J., and John M. Ramsbottom, Glenn Ellyn, Ill., assignors to Standard Packaging Corporation, New York, N.Y.

Continuation of Ser. No. 242,430, April 10, 1972, abandoned. This application Mar. 31, 1976, Ser. No. 672,455

Int. Cl.[2] B65D *81/20*

U.S. Cl. 426—127 **6 Claims**



1. A package for controlling the atmospheric condition of a package product comprising a meat product, a semi-rigid performed tray for holding said meat product, said tray being formed from a material which is oxygen impermeable and a composite lid, said composite lid being heat-sealed to said preformed tray around the periphery thereof to define a sealed package containing said meat product, a substantially non-oxygen containing atmosphere surrounding said meat product, said composite lid comprising an inner layer, an intermediate adhesive layer and an outer layer, said inner layer being formed from an oxygen impermeable material, said outer layer being formed from an oxygen impermeable material, said outer layer being secured to said inner layer by said adhesive layer to provide a hermetically sealed oxygen impermeable package, said outer layer and said adhesive layer being removable from said inner layer without destruction of said seal between said tray and said lid so as to allow oxygen to flow through said inner layer.

4,055,673

METHOD OF MOISTENING WHOLE GRAINS

Roman Mueller, Niederuzwil, Switzerland, and Josef Kalapos, Mommenheim, Germany, assignors to Gebrueder Buehler AG, Uzwil, Switzerland

Division of Ser. No. 547,357, Feb. 5, 1975, abandoned. This application Jan. 14, 1976, Ser. No. 649,100

Claims priority, application Switzerland, Feb. 8, 1974, 1757/74; Oct. 2, 1974, 13240/74; Nov. 22, 1974, 15610/74

Int. Cl.[2] A23L *1/212;* **A23P** *1/00*

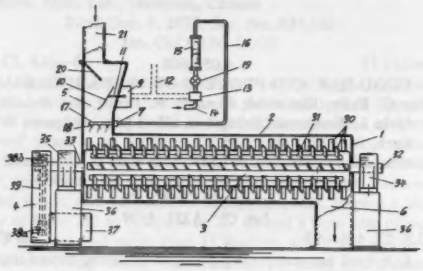
U.S. Cl. 426—231 **13 Claims**

1. A method of uniformly moistening whole grain kernels to a predetermined uniform moisture content in preparation for milling, comprising the steps of:

a. admitting whole grain kernels through an inlet at one end of a closed, circular vessel having an inner circumferential wall;

b. admitting metered quantities of water into contact with said grain kernels in the region of said vessel inlet;

c. accelerating the admitted grain kernels circumferentially within the vessel and creating a whirling tubular veil of generally freely moving grain kernels in the vicinity of the inner circumferential wall of the vessel that moves substantially continuously lengthwise of the vessel, through the use of a rotor that extends axially within the vessel, the rotor having a plurality of individual blades projecting transversely of the rotor axis and having free outer ends, said blades being spaced over substantially the entire length of the rotor and generally uniformly spaced around its circumference, the blades numbering at least twenty blades for every square meter of surface area of said inner circumferential wall, and the rotor being made to rotate at



a speed requisite for imparting to the outer ends of the blades a circumferential velocity of between substantially six meters per second and thirty meters per second, whereby said whole grain kernels are impacted within the whirling tubular veil by the rotating blades and caused to frictionally engage each other, thereby effecting uniform moistening of the grain kernels;

d. and removing and uniformly moistened whole grain kernels through an outlet at the other end of the vessel.

4,055,674

METHOD FOR THE REMOVAL OF AFLATOXIN FROM CEREALS, OIL SEEDS AND FEEDSTUFFS

Nobumitsu Yano; Itaru Fukinbara, both of Tokyo; Koji Yoshida, and Tokiyoshi Korenaga, both of Sakaimachi, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 14, 1976, Ser. No. 696,148

Claims priority, application Japan, June 17, 1975, 50-72722

Int. Cl.[2] A23L *3/00*

U.S. Cl. 426—430 **9 Claims**

1. A method for the removal of Aflatoxin from cereals, oil seeds and feedstuffs contaminated therewith which comprises subjecting said cereals, oil seeds and feedstuffs to at least one extraction with liquid dimethyl ether and water at temperatures not higher than those at which any proteins in said materials are thermally denaturated, said water being employed in an amount of 2 to 8% by weight with respect to the liquid dimethyl ether.

4,055,675

PREPARATION OF PUFFED FRUIT

Karel Popper, Danville; William G. Schultz, El Cerrito; Wayne M. Camirand, Albany; Earl Hautala, Martinez; George H. Robertson, Berkeley; Ladell Crawford, Richmond, and Bernard J. Finkle, Berkeley, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 13, 1976, Ser. No. 750,324

Int. Cl.[2] A23L *1/212*

U.S. Cl. 426—470 **1 Claim**

1. A process for preparing a food product from bite-size pieces of fruit, which consists of the steps of

a. partially dehydrating the fruit to a moisture content of about 10–50%,

b. contacting the dehydrated fruit solely with liquid carbon

dioxide at ambient temperature for about from 0.5–6 hours, said liquid carbon dioxide being maintained under a pressure of about 900–1000 psig,

c. rapidly releasing the pressure to puff the fruit, and then

d. heating the puffed fruit at about 70°–90° C for 1–24 hours to form a crisp outer layer on the surface of the puffed fruit.

4,055,676

REPLACEMENT OF SUGAR IN A SUGAR-CONTAINING FOOD AND PROCESS

Peter H. Foulkes, Fox River Grove, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 579,224, May 20, 1975, abandoned. This application Apr. 1, 1976, Ser. No. 672,659

Int. Cl.² A23B *4/12, 4/14*

U.S. Cl. 426—532 **5 Claims**

1. In a semi-moist pet food comprising:

a. about 3 percent to about 65 percent by weight of the pet food of a protein source wherein the protein source is at least one selected from the group consisting of at least one meat, at least one meat by-product, and at least one vegetable protein source;

b. about 0.1 percent to 35 percent by weight of the pet food of sugar;

c. about 0.5 percent to about 3.0 percent of at least one edible acid;

d. about 0.01 percent to about 0.35 percent by weight of the pet food of at least one antimycotic;

the improvement wherein the semi-moist pet food further comprises:

1. about 7 percent to about 14 percent by weight of the pet food of corn syrup, wherein the corn has a dextrose equivalent of about 10 to about 60; and

2. about 5 percent to about 9 percent by weight of the pet food of propylene glycol

the combination of corn syrup and propylene glycol serving as a replacement for 55 to 100 percent of the sugar.

4,055,677

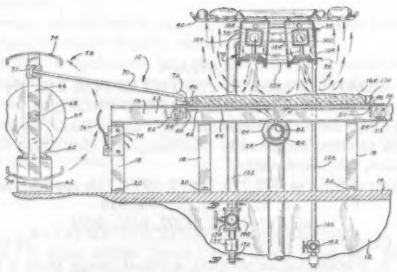
METHOD OF BROILING

Lyall B. White, 1408 Jacobson Circle, Sun City Center, Fla. 33570

Continuation-in-part of Ser. No. 522,596, Nov. 11, 1974, Pat. No. 3,943,910. This application Jan. 7, 1976, Ser. No. 647,043

Int. Cl.² A23L *1/01*

U.S. Cl. 426—438 **3 Claims**



1. A method of cooking a portion of food including the steps of:

a. positioning the food on a platter;

b. positioning the platter with the portion of food thereon over a lower heat source of sufficient intensity to cause said food portion to fry on the heat transmitted from the lower source through the platter;

c. simultaneously subjecting the food portion to heat from above from an upper heat source of sufficient intensity to cause the food portion to be broiled by the heat from the upper heat source;

d. reciprocating at least the upper heat source and the food portion horizontally back and forth with respect to each other; and

e. maintaining the food and platter relationship relative to said lower and upper heat sources during reciprocation until cooking of the food to a desired degree is achieved.

4,055,678

SWEETENER DERIVATIVES

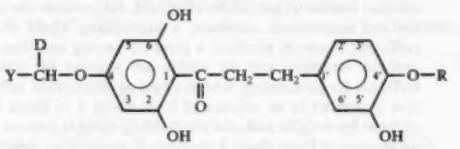
Guy A. Crosby, and Grant E. DuBois, both of Palo Alto, Calif., assignors to Dynapol, Palo Alto, Calif.

Division of Ser. No. 477,730, June 10, 1974, Pat. No. 3,976,687. This application Jan. 12, 1976, Ser. No. 648,423

Int. Cl.² A23L *1/236*

U.S. Cl. 426—548 **9 Claims**

1. A compound of the formula



wherein Y is a sulfonic acid or a pharmacologically acceptable salt thereof, D is a linear polyether of the formula CH_3—$(O—CH_2—CH_2)_n$— wherein n has a value of from 1 to 30 inclusive, and R is a lower alkyl of from 1 to 4 carbon atoms inclusive.

8. A sweetened edible composition comprising an edible composition having in intimate admixture therewith from 0.0001% to about 0.05% by weight of a compound of claim **1.**

4,055,679

PLASTIC FAT PRODUCT

Hans Robert Kattenberg, and Charles Cornelis Verburg, both of Vlaardingen, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 2, 1976, Ser. No. 663,015

Claims priority, application United Kingdom, Mar. 4, 1975, 8937/75

Int. Cl.² A23D *3/00*

U.S. Cl. 426—607 **6 Claims**

1. Fat product containing 50–75% of palm-based fats selected from the group consisting of hydrogenated and unhydrogenated palm oil and solid and liquid fat fractions thereof, 20–90% of said palm-based fats being co-randomised with the balance of fats containing at least 80% of fatty acids with a chain length of 18 carbon atoms or more to provide at least 50% of co-randomised triglycerides in said fat product, the balance of the palm-based fats being non-randomised, said fat product containing 15–25% of 1,3-disaturated, -2-mono-unsaturated triglycerides, the weight ratio between 1,3-disaturated,-2-mono-unsaturated and 1,2-disaturated,-3-mono-unsaturated triglycerides being within the range of 1.8 to 1.5, the saturated acid residues of forementioned triglycerides having 8–24 carbon atoms.

4,055,680

PELLETIZING COTTON LINT

Gene L. Duke, P.O. Box 988, Brownfield, Tex. 79316

Filed Aug. 2, 1972, Ser. No. 277,400

Int. Cl.² A23K *1/02*

U.S. Cl. 426—635 **7 Claims**

1. A lint pellet, the lint of which is ammonia-neutralized lint of dry-acid-delinted cottonseed.

4,055,681

METHOD OF MAKING A DRY-TYPE PET FOOD

Alexander Balaz, Barrington; David P. Bone, Palatine, and Edward L. Shannon, Barrington, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,759

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 16, 1976

Int. Cl.[2] A23J *3/00;* A23K *1/14*

U.S. Cl. 426—656 37 Claims

1. A method for the production of a dry pet food product containing less than 15 percent by weight moisture having a soft elastic, substantially fibrous meat-like texture and appearance comprising the steps of:

A. blending a dough containing fat, at least one proteinaceous adhesive selected from the group consisting of an alkali modified oil seed vegetable protein, alkali modified wheat gluten, albumen, collagen, sodium caseinate, calcium caseinate, potassium caseinate, magnesium caseinate and ammonium caseinate, a plasticizing agent with sufficient water to produce a product having less than 1 percent moisture and an additional amount of water sufficent for processing; wherein said proteinaceous adhesive is present in an amount of from about 4 to about 60 percent by weight; and said plasticizing agent is present in an amount of from about 2 to about 40 percent by weight;

B. cooking said dough at a temperture between 200° and 300°F.;

C. stretching the cooked mixture to form a fibrous-like mixture; and

D. immediately cooling the stretched mixture to prevent the fibers from watering.

4,055,682

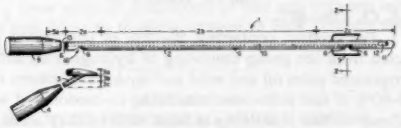
CATHETER AND THE METHOD OF MAKING

Edward Wilson Merrill, Cambridge, Mass., assignor to High Voltage Engineering Corporation, Burlington, Mass.

Continuation-in-part of Ser. No. 200,560, Nov. 19, 1971, Pat. No. 3,773,871, Ser. No. 205,156, Dec. 6, 1971, Pat. No. 3,832,458, and Ser. No. 417,053, Nov. 19, 1973, abandoned. This application Mar. 25, 1976, Ser. No. 670,422

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—2 2 Claims



1. The process for rendering superficially hydrophilic a catheter formed from a silicone composition by forming on the surface thereof a hydrophilic polymeric layer so thin that the stiffness of the catheter after treatment when dry is not substantially greater than that of an uncoated catheter of the same composition and degree of crosslinking, which method comprises contacting the surface of the catheter uniformly with a liquid containing free-radical polymerizable precursor to said hydrophilic polymer layer, said precursor comprising N-vinylpyrrolidone (NVP), NVP and water or NVP, a hydroxalkyl acrylate and water, exposing said surface while in contact with said precursor to high rate dosage of high energy ionizing radiation sufficient to form a hydrophilic surface on said catheter, and controlling the intensity and duration of radiation and the concentration of the precursor to prevent excessive migration of precursor into the silicone polymer composition, thereby causing said precursor to graft to said surface and thereby producing a thin smooth hydrophilic layer uniformly over the entire surface.

4,055,683

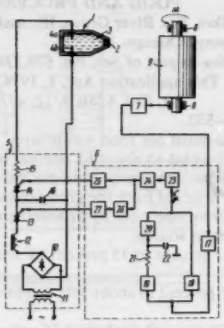
METHOD OF BALANCING ROTORS

Anatoly Alexandrovich Gusarov, Universitetsky prospekt, 5, kv. 470, and Lev Nikolaevich Shatalov, ulitsa Utrennyaya, 3, kv. 107, both of Moscow, U.S.S.R.

Division of Ser. No. 474,106, May 28, 1974, Pat. No. 3,996,883. This application Sept. 23, 1976, Ser. No. 725,992

Int. Cl.[2] B05B *12/04*

U.S. Cl. 427—8 2 Claims



1. A method of balancing rotors, comprising a procedure including the steps of: finding a "light" point on the surface of the rotor being balanced while being rotatably supported in front of a nozzle measuring the parameters of vibration of the rotor while rotating; transmitting a signal to nozzle energizing means in response to said vibration parameter measurement during rotor vibration; discharging predefined successive amounts of a quickly solidifying balancing compound in the liquid state from the nozzle to said "light" point; employing a force of a controllable electro-hydraulic impact for governing the mass of the compound applied to said rotor; and repeating the procedure until balance of the rotor is attained.

4,055,684

COATED CARRIER PARTICLES FOR USE IN ELECTROPHOTOGRAPHIC PROCESS

Evan Serge Baltazzi, Northfield, and Pabitra Datta, Lyndhurst, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Division of Ser. No. 528,712, Dec. 2, 1974. This application May 3, 1976, Ser. No. 682,310

Int. Cl.[2] G03G *13/09, 9/10, 9/14*

U.S. Cl. 427—18 10 Claims

1. A process for developing a visual image from a latent electrostatic image which comprises applying to the surface upon which is formed the latent electrostatic image a developer mix comprising a finely divided electroscopic powder and discrete solid carrier particles selected from the group consisting of glass beads, ceramic beads, grains of sand and metallic particles, coated with a dispersion in a low surface energy thermoplastic polymeric binder of dried, finely ground particles in the micron to submicron range of a polymer consisting essentially of a backbone of a highly crosslinked copolymer of styrene and divinylbenzene having ion exchanging groups chemically bonded thereto; said coating being about from 1 micron to 3 microns in thickness.

4,055,685

PROCESS FOR THE IMPROVEMENT OF THE ADHESION OF PHOTOGRAPHIC LAYERS TO A FILM WEB BY MEANS OF A CORONA TREATMENT

Gunther Bayer, Leverkusen; Hans Georg Fitzky, Odenthal-Hahnenberg; Herbert Hoyer, Leverkusen; Gunter Luttgens, Langenfeld, and Wolfgang Muller-Bardorff, Cologne, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 26, 1976, Ser. No. 680,100

Claims priority, application Germany, Apr. 30, 1975, 2519233

Int. Cl.[2] G03C *1/78, 1/96*

U.S. Cl. 96—87 R 5 Claims

1. A process for the corona treatment of a web of polyethylene coated photographic paper in which the web is subjected to alternating current corona discharge in two consecutive stages, the frequency of the corona discharge in the first stage being from 5 to 100 kHz and the frequency in the second stage being from 500 to 2000 kHz.

4,055,686

METHOD OF FORMING METAL HYDRIDE FILMS

Robert Steinberg, Berea; Donald L. Alger, Cleveland, and Dale W. Cooper, Rocky River, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 20, 1976, Ser. No. 659,882

Int. Cl.[2] G21G *4/02, 3/04*

U.S. Cl. 427—124 14 Claims

1. A process for coating a substrate with a continuous, stoichiometric, metal hydride film comprising the steps of

selecting a substrate compatible with a hydride forming metal to be coated thereon,

chemically cleaning said substrate,

disposing said substrate in a vacuum chamber capable of being evacuated to a pressure of about 10^{-10} Torr, said substrate being enclosed by a shroud, a sublimator of the hydride forming metal also being disposed within said shroud with a shutter positioned between said substrate and said sublimator,

sputter etching said substrate,

evacuating said chamber to a pressure of from about 10^{-8} to 10^{-10} Torr,

vapor depositing said hydride forming metal on the interior of said shroud with said shutter closed to form a gettering layer of said hydride forming metal on the interior of said shroud,

opening said shutter to cause a film of said hydride forming metal to vapor deposit on said substrate,

directing a hydrogen isotopic gas into said chamber to achieve a pressure such that the gas is diffused through said hydride forming metal film at a rate substantially and continuously greater than the rate at which it is absorbed at the surface of said film thereby converting said film to a metal hydride.

4,055,687

BATTERY TERMINAL POST CLEANER

Maurice R. Blue, 60960 Crown Court, South Bend, Ind. 46614

Filed Jan. 26, 1976, Ser. No. 652,501

Int. Cl.[2] B23P *7/00*

U.S. Cl. 427—142 1 Claim

1. A method of treating a corroded terminal post of an electrical storage battery wherein a coating layer of corrosion products and oily residues adheres to said post, which comprises, spraying onto said coating layer of said terminal post an aerosol of a mixture consisting essentially of a liquefied halogenated hydrocarbon propellant and non-volatile mineral oil, said aerosol being sprayed from an aerosol pressure package under an internal pressure of a vapor phase of said propellant, said aerosol spray being deposited as a coating film on said coating layer and said propellant foams and evaporates while in contact with said layer and thereby removes the oily residues from said coating layer and transforms said corrosion products to a powder whereby said post becomes clean and said mineral oil remains as a corrosion-resistant coating on said post.

4,055,688

METHOD AND APPARATUS FOR APPLYING SYNTHETIC RESIN POWDER IN A GRATE-SHAPED COATING TO WEB MATERIAL

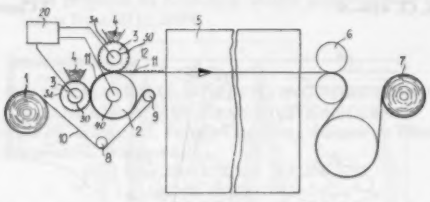
Hans-Peter Caratsch, Itenhardstrasse 16, 5620 Bremgarten, Switzerland

Filed May 13, 1976, Ser. No. 686,141

Claims priority, application Switzerland, Mar. 31, 1976, 4000/76; Mar. 31, 1976, 4001/76

Int. Cl.[2] B05D *5/00, 1/00, 7/00*

U.S. Cl. 427—195 2 Claims



1. A method for applying synthetic resin powder in the form of a substantially grate-shaped coating to web material, comprising the steps of: heating a web of material, applying a lower layer of the synthetic resin powder in the form of piles by means of a relief-like structured printing roll to the material web, applying an upper layer in the form of piles in coincidence to and upon the lower layer by means of a relief-like structured printing roll, bringing the powder of both layers during transfer thereof in the rolls to its sintering temperature, heating the web material prior to forming the lower layer approximately to the plasticizing temperature of the powder for this layer, and placing the powder piles of the upper layer upon the powder piles of the lower layer immediately after transferring the powder piles of the lower layer to the web material.

4,055,689

PROCESS FOR FLAMEPROOFING ORGANIC FIBER MATERIAL

Hermann Nachbur, Dornach, and Arthur Maeder, Therwill, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

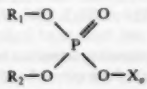
Division of Ser. No. 483,493, June 27, 1974, Pat. No. 3,946,092. This application Jan. 12, 1976, Ser. No. 648,541

Claims priority, application Switzerland, July 3, 1973, 9671/73

Int. Cl.[2] C09K *3/28;* C09D *5/18*

U.S. Cl. 427—379 15 Claims

1. A process for flameproofing organic fiber material, which comprises applying to said material a preparation which contains a phosphate of the formula



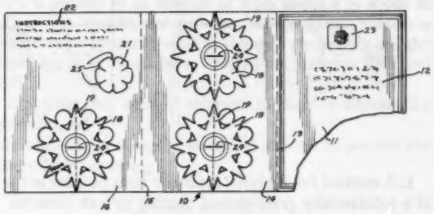
wherein each of R_1 and R_2 is bromoalkyl with 2 to 6 carbon atoms and X_o is unsubstituted phenyl, phenyl which is substituted in ortho- or para-position by phenyl, monoalkylphenyl or dialkylphenyl with 1 to 9 carbon atoms in each alkyl moiety; drying the material and subjecting it to a heat treatment at 175° to 220° C. for about 10 to 200 seconds.

4,055,690

STAR ORNAMENT AND CARD

Michael P. Patterson, 11701 W. River Hills Drive No. 206, Burnsville, Minn. 55337

Filed May 12, 1976, Ser. No. 685,817
Int. Cl.² B65D *65/28*
U.S. Cl. 428—9 **2 Claims**



1. An ornament which may be assembled from a greeting card comprising a flat disc-like mounting member a plurality of flat panels of generally identical peripheral edge shape, a separate transversely extending bisecting score line in the center portions of each of said panels, each of said panels being folded along the score lines to form a pair of panel portions joined at an apex and forming a V, slit means in said panel portions extending across the folded edge and terminating short of the peripheral edges of the respective panel and of size to receive said mounting member whereby said mounting member retains said panel portions in a generally V shape with the panel portions extending generally radially from the center of said disc-like mounting member and wherein said mounting member has a plurality of notches and teeth defined in its peripheral edge spaced annularly around said member, said panel portions of each folded panel fitting into an associated notch and being held thereby in a desired radial position.

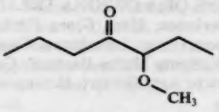
4,055,691

USES OF α-OXY(OXO) SULFIDES AND ETHERS IN FOODSTUFFS AND FLAVORS FOR FOODSTUFFS

William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 730,537, Oct. 7, 1976. This application Feb. 4, 1977, Ser. No. 765,775
Int. Cl.² A23L *1/226, 1/235*
U.S. Cl. 426—534 **2 Claims**

1. A process for augmenting or enhancing the taste or aroma of a foodstuff comprising the step of adding to said foodstuff from about 0.1 ppm up to about 50 ppm by weight of said foodstuff of a compound having the structure:

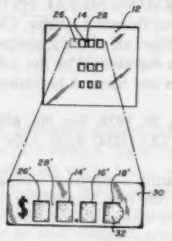


4,055,692

GAS PUMP COUNTER DISPLAY AND METHOD OF FORMATION THEREOF

Bernard S. Zionts, 11 Rye Ridge Parkway, West Hartford, Conn. 06117, and Victor Zionts, 6 Jonathan Law Court, Waterford, Conn. 06385

Filed June 4, 1976, Ser. No. 692,998
Int. Cl.² B32B *3/14*
U.S. Cl. 428—78 **6 Claims**



1. A modified display plate for liquid dispensing apparatus, the display plate having:

an array of aligned windows formed in the body of the display plate;

an enlarged window in said array; and

a mask mounted on said display plate, said mask having a plurality of windows therein each aligned with each of said display plate windows other than said enlarged window and two windows aligned with the enlarged window of the display plate.

4,055,693

LEATHERLIKE FABRICS

Frank Peter Civardi, Wayne, N.J., assignor to Inmont Corporation, New York, N.Y.

Continuation of Ser. No. 542,993, Jan. 22, 1975, Pat. No. 3,988,488. This application Aug. 4, 1976, Ser. No. 711,589
The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.
Int. Cl.² D06C *11/00*
U.S. Cl. 428—91 **8 Claims**

1. A leather substitute comprising a fabric of interlaced

multifiber yarns having extending from one face thereof a nap of fibers teased from said yarns, said nap having fibers thereof bonded together by bonding agent, said nap, with bonding agent, having a thickness of about 0.3 mm to about 1 mm and comprising spaced flexible clumps of nap fibers bonded together by said bonding agent, said clumps containing more than five nap fibers per clump, the void volume in said nap, with bonding agent, being at least about 70%, said spaced clumps being movable to project more or less from the surrounding nap, said clumps giving said nap a rough appearance like split suede leather, said fabric having on the upper face thereof opposite said nap a cellular elastomeric polymer layer having a continuous substantially nonporous skin at its upper surface.

4,055,694

STARCH LATEX COMPOSITION

Robert B. Hadgraft, East Ridge, and John J. Martin, Hixson, both of Tenn., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 461,471, April 16, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,999

The portion of the term of this patent subsequent to Dec. 18, 1990, has been disclaimed.

Int. Cl.[2] B32B *3/02;* **C08L** *3/02;* **D04H** *11/00;* **D05C** *17/02*

U.S. Cl. 428—95 **9 Claims**

1. A latex composition comprising an elastomeric polymer latex and up to about 66 parts by weight of an extender per 100 parts of said polymer latex consisting essentially of a mixture of granular starch and borax, the weight ratio of granular starch to borax being from about 1.5:1 to about 12:1.

4,055,695

FOAMED POLYOLEFINE FILMS

Anthony Graham Marshall Last, Welwyn Garden City, and John Albert Rixon, Shefford, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 105,622, Jan. 11, 1971, abandoned. This application Apr. 17, 1975, Ser. No. 568,835

Claims priority, application United Kingdom, Jan. 30, 1970, 4647/70

Int. Cl.[2] B32B *3/10, 5/18*

U.S. Cl. 428—195 **8 Claims**

1. A wall or ceil covering comprising a printed open celled foamed film of foamed polyolefine derived from a blend containing between 60% and 90% by weight of low density polythene and between 40% and 10% by weight of a crystalline polyolefine, said foamed film having a bulk density between 0.1 and 0.4 grams/cc and an open cell structure in the range of 40 to 90% open cells, the surface of said film having been subjected to surface treatment on at least one surface to improve the ink bonding properties of that surface, said film being characterized by higher abrasion resistance and higher dry ink abrasion resistance than corresponding surface treated film made from 100% by weight low density polythene.

4,055,696

POROUS POLYPROPYLENE HOLLOW FILAMENTS AND METHOD MAKING THE SAME

Kensuke Kamada; Shunsuke Minami, and Kanji Yoshida, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed June 23, 1976, Ser. No. 698,929

Claims priority, application Japan, July 9, 1975, 50-84718

Int. Cl.[2] D02G *3/00;* **D01D** *5/12*

U.S. Cl. 428—398 **2 Claims**

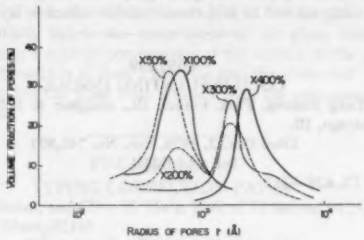
1. Porous polypropylene hollow filaments consisting essentially of polypropylene, wherein;

the thickness of the surrounding wall portion is less than 60 μ;

many fine interconnecting holes are present in said surrounding wall portion;

the distribution curve of the radius of said fine holes has at least one maximum point within the range of 200–1200 A;

said porous polypropylene filaments being more permeable to nitrogen gas than to oxygen gas and;



wherein said porous polypropylene hollow filaments have been prepared by stretching hollow polypropylene filaments from 30 to 200%.

4,055,697

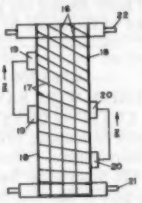
WOVEN MATERIAL WITH FILLING THREADS AT ANGLES OTHER THAN RIGHT ANGLES

Donald W. Schmanski, Carson City, Nev., assignor to Fiberite Corporation, Winona, Minn.

Filed May 19, 1975, Ser. No. 578,372

Int. Cl.[2] B32B *5/12*

U.S. Cl. 428—113 **16 Claims**



1. An anistropic material comprising,

a plurality of lengthwise spaced threads,

a plurality of filling threads interwoven with said lengthwise threads so as to place some areas of said filling threads on opposite sides of said lengthwise threads,

a number of said filling threads being interwoven with said lengthwise threads along pre-oriented axes and at predetermined angles other than a right angle with respect to said lengthwise threads to impart physical characteristics to said material at angles other than at right angles thereto,

said interwoven filling threads and said lengthwise threads interlocking one another to provide rail-shear strength and reduce lateral movement and delamination effects between said lengthwise and filling threads.

4,055,698

POLYOLEFIN WEB HAVING REMOISTENABLE ADHESIVE BONDED THERETO

Floyd T. Beery, Prairie Village, Kans., assignor to Hallmark Cards, Incorporated, Kansas City, Mo.

Filed June 25, 1976, Ser. No. 699,702

Int. Cl.[2] B32B *7/10, 7/12;* **D04H** *13/00*

U.S. Cl. 428—262 **14 Claims**

1. A remoistenable polyolefin web, comprising:

a substrate formed of a polyolefin material;

a primer layer applied to at least one face of said substrate, said primer layer comprising the dried residue of a coating composition applied in liquid form and consisting essen-

tially of a chlorinated polyolefin and a copolymerized olefinic vinyl acetate; and

a remoistenable adhesive layer applied over said primer layer and principally comprising a polyvinyl alcohol,

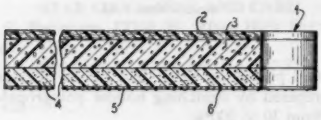
said primer layer having the properties of bonding to said substrate and to said remoistenable adhesive layer.

4,055,699

COLD INSULATING INSOLE

Du Yung Hsiung, Park Forest, Ill., assignor to Scholl, Inc., Chicago, Ill.

Filed Dec. 2, 1976, Ser. No. 746,891
Int. Cl.² B32B *3/26*
U.S. Cl. 428—311 **7 Claims**



1. A laminated multi-layer insole for disposition in an article of footwear to insulate the foot from the cold developed in the sole of the footwear from walking or standing on a cold surface which comprises four superimposed layers comprising from top to bottom, a thin soft fabric layer laminated to the top of an open cell foam layer, a dense cross-linked polyolefin layer laminated to the bottom of said foam layer, and an aluminum coated moisture barrier layer of polymeric material laminated to the bottom of said cross-linked polyolefin layer, and said polymeric material layer having the aluminum coating on the exposed bottom face of the insole to engage the footwear.

4,055,700

THIN COMPOSITE WIRE SAW WITH SURFACE CUTTING CRYSTALS

Axel Georg Ronnquist, Sollentuna; Erik Tommie Lindahl, Solna, and Nicolay Stefanov Stoilov, Tyreso, all of Sweden, assignors to Lumalampan AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 502,836, Sept. 3, 1974, abandoned. This application June 2, 1975, Ser. No. 582,681
Int. Cl.² B27B *33/16*
U.S. Cl. 428—366 **12 Claims**

1. A composite metal saw wire comprising (i) a high tensile strength metal or alloy wire core which is at least one metal selected from the group comprising tungsten, molybdenum, tantalum, osmium, rhenium, and alloys thereof having a thickness between 10 and 500 μm, and (ii) an integral crystalline surface layer having a thickness between about 1.5 and 10 μm, said surface layer consisting essentially of hard cutting crystals selected from the group consisting of boron, and the borides, nitrides, and carbides of the transition metals and silicon with cutting edges projecting irregularly from the surface thereof.

4,055,701

AZIDO-SILANE COMPOSITIONS

James Glenn Marsden, Amawalk, and Peter Joseph Orenski, Ossining, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 483,367, June 26, 1974, Pat. No. 4,002,651. This application Oct. 18, 1976, Ser. No. 733,418
Int. Cl.² C07C *117/00, 121/86;* B32B *9/00, 25/20*
U.S. Cl. 428—391 **10 Claims**

1. An article of manufacture comprising a material selected from the group consisting of siliceous materials, metals, metal oxides and organic polymers coated with a solubilized azido-containing silane composition of matter produced by a process which comprises reacting in the presence of a solvent (a) an azido-containing compound selected from the group consisting of carboxylic acids of the formula

$$(N_3X)_a—Ar—(R)_n—COOH$$

and the ammonium salts of said acids, wherein X is a radical selected from the group consisting of sulfonyl and formyl radicals, a is an integer of from 1 to 2, Ar is an aryl or hydroxy-substituted aryl radical, R is an alkylene radical and n has a value of 0 or 1; and (b) an amino-containing silane having the formula

$$R'—Si(R^2_b)—Y_{3-b}$$

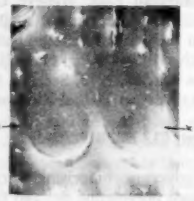
wherein R^2 is a monovalent hydrocarbon radical, b has a value of from 0 to 2, Y is a hydrolyzable group selected from the class consisting of alkoxy and aryloxy radicals, and R' is an organic radical directly bonded to the silicon atom of said silane through a carbon to silicon bond, said organic radical further containing at least one nitrogen atom, said solvent being present in an amount sufficient to solubilize the azido-containing silane product of (a) and (b).

4,055,702

ADDITIVE-CONTAINING FIBERS

Roger T. Guthrie, Westfield; Justin L. Hirshman, East Brunswick; Stanley Littman, Sharon; Edwin L. Sukman, Upper Montclair, and Philip H. Ravenscroft, Rowayton, all of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Division of Ser. No. 521,843, Nov. 7, 1974, Pat. No. 4,001,367, which is a continuation-in-part of Ser. No. 456,130, March 29, 1974, abandoned. This application Dec. 2, 1975, Ser. No. 637,024
Int. Cl.² B29C *17/02;* D02G *3/00*
U.S. Cl. 428—398 **10 Claims**



1. A melt spun, cold drawn fiber of a synthetic organic polymer selected from the group consisting of polyesters, polyamides, polypropylene and high density polyethylene, said fiber containing from 0.1 to 25%, based on the weight of said fiber, of an additive which at least partially occupies a network of interconnecting microvoids extending along the entire length and throughout the cross section of said fiber, said additive being selected from the group consisting of dye receptors, flame retardants, anti-static agents, stabilizers, mildewcides and antioxidants.

4,055,703

ION EXCHANGE STRENGTHENED GLASS CONTAINING P_2O_5

Dale W. Rinehart, Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 605,108, Aug. 15, 1975, Pat. No. 4,015,045, which is a continuation-in-part of Ser. No. 432,006, Jan. 9, 1974, abandoned. This application July 19, 1976, Ser. No. 706,660
Int. Cl.² B32B *17/00;* C03C *21/00*
U.S. Cl. 428—410 **16 Claims**

1. A glass essentially transparent to visible light and capable of being strengthened by ion exchange with potassium ions, comprising by weight on the oxide basis:

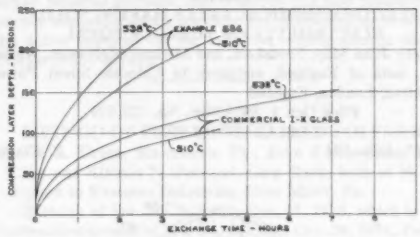
34 to 61 percent SiO_2

12 to 20 percent Na_2O
2 to 9 percent K_2O
17 to 23 percent $(Na_2O + K_2O)$
2 to 15 percent Al_2O_3
0 to 10 percent ZrO_2
9 to 23 percent $(Al_2O_3 + ZrO_2)$
2 to 20 percent P_2O_5
0 to 8 percent ZnO
0 to 6 percent MgO
0 to 5 percent TiO_2
2 to 9 percent $(ZnO + MgO + TiO_2)$
0 to 0.1 percent Li_2O

wherein said constituents comprise at least 90 percent by weight of the glass and are proportioned relative to one another so as to provide the glass with a viscosity of 100 poises at a temperature less than 2800° F. (1538° C.)

4. A chemically strengthened transparent glass article exhibiting a surface compressive stress after being subjected to surface abrasion composed of an interior portion which is in tension and a surface compressive layer, said interior portion comprised of by weight on the oxide basis:

34 to 61 percent SiO_2
12 to 20 percent Na_2O
2 to 9 percent K_2O
17 to 23 percent $(Na_2O + K_2O)$
2 to 15 percent Al_2O_3
0 to 10 percent ZrO_2
9 to 23 percent $(Al_2O_3 + ZrO_2)$
2 to 20 percent P_2O_5



0 to 8 percent ZnO
0 to 6 percent MgO
0 to 5 percent TiO_2
2 to 9 percent $(ZnO + MgO + TiO_2)$
0 to 0.1 percent Li_2O

said constituents comprising at least 90 percent by weight of the interior portion and proportioned relative to one another so as to provide a glass having a viscosity of 100 poises at a temperature less than 2800° F. (1538° C.), said surface compressive layer having a higher content of K_2O and a lower content of Na_2O than the interior portion.

10. A method of strengthening a transparent glass article comprising the steps of:

a. contacting a source of potassium ions with the surface of a glass article comprising by weight on the oxide basis:

34 to 61 percent SiO_2
12 to 20 percent Na_2O
2 to 9 percent K_2O
17 to 23 percent $(Na_2O + K_2O)$
2 to 15 percent Al_2O_3
0 to 10 percent ZrO_2
9 to 23 percent $(Al_2O_3 + ZrO_2)$
2 to 20 percent P_2O_5
0 to 8 percent ZnO
0 to 6 percent MgO
0 to 5 percent TiO_2
2 to 9 percent $(ZnO + MgO + TiO_2)$
0 to 0.1 percent Li_2O

said constituents comprising at least 90 percent by weight of the glass article and proportioned relative to one another so as to provide a glass having a viscosity of 100 poises at a temperature less than 2800° F. (1538° C.);

b. heating said source of potassium ions while in contact with the glass to a temperature at which potassium ions from said source replace sodium ions in the glass, but essentially below the strain point of the glass, thereby creating a zone of compression at the surface of the glass which extends at least 5 microns into the glass; and

c. removing the glass from contact with the potassium ion source.

4,055,704

TYPING CORRECTION PAPER

John Fahimian, and Clive H. Hare, both of 72 Second St., Cambridge, Mass. 02141

Filed Aug. 1, 1975, Ser. No. 601,323
Int. Cl.[2] B32B *9/06, 5/30, 9/04*
U.S. Cl. 428—411 **11 Claims**

1. A correction sheet material for masking characters on a substrate, which material consisting essentially of:

a. a carrier sheet; and

b. a thin dry coating layer on the carrier sheet, the coating layer adapted, on the application of sufficient pressure, to be transferred from the carrier sheet onto the characters on the substrate, the coating layer comprising a pigment in an amount to provide sufficient opacity to cover the characters to be masked, and a high molecular weight organic ammonium salt as a binding and adhesive agent for the pigment, the salt insoluble in water and in oils used in typewriter ink and carbon paper, the salt present in the coating layer in both continuous film and precipitated salt form, whereby, on the application of pressure, a strong opaque film of pigment and precipitated salt particles is transferred to mask the character on the substrate.

4,055,705

THERMAL BARRIER COATING SYSTEM

Stephan Stecura, Parma, and Curt H. Leibert, Middleburg Heights, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 14, 1976, Ser. No. 686,449
Int. Cl.[2] B32B *15/04*
U.S. Cl. 428—633 **8 Claims**

1. A coated article of manufacture having a thermal barrier coating system comprising

a substrate selected from the group consisting of nickel-base alloys and cobalt-base alloys,

a bond coating consisting essentially of NiCrAlY covering said substrate, and

a thermal barrier coating consisting essentially of zirconia stabilized with another oxide.

4,055,706

PROCESSES FOR PROTECTING REFRACTORY METALLIC COMPONENTS AGAINST CORROSION

Philippe M. Galmiche, Clamart, and Pierre J. Lepetit, Saint-Vrain, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon-sous-Bagneux, France

Filed July 10, 1975, Ser. No. 594,802
Int. Cl.[2] B23P *3/00*
U.S. Cl. 428—652 **12 Claims**

1. In a process of forming a coating selected from nickel and cobalt-based coatings on a surface of a component comprising a metallic refractory material comprising at least 50% by weight of metal selected from the group consisting of iron, cobalt and nickel, the improvement comprising, forming chemically at least one layer comprising an alloy of boron with a member selected from the group consisting of nickel, cobalt

and nickel/cobalt on the component, said layer being deposited by immersing the surface of the component in an aqueous bath containing at least one boron salt and at least one salt selected from nickel salts and cobalt salts, after which the boron is eliminated from the layer by heating the coated component in a halogenated and hydrogenated atmosphere at a temperature between 800° and 1250° C, the elimination of the boron being accompanied by diffusion of at least one of cobalt and nickel into the metallic refractory material.

4,055,707

SELECTIVE COATING FOR SOLAR PANELS

Glen E. McDonald, Strongsville, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 22, 1975, Ser. No. 643,041
Int. Cl.[2] F24J *3/02;* **B32B** *15/18, 15/20;* **B05D** *3/12*
U.S. Cl. 428—652 **8 Claims**

1. In apparatus for collecting solar energy of the type having a composite heating panel for absorbing said solar energy and converting the same to heat, the improvement comprising

a metallic substrate forming a high conductivity base for said panel, said substrate having at least one surface exposed to said solar energy,

a layer of dull nickel on said one surface to lower the emissivity of said surface, and

a coating of black chrome on said layer of dull nickel, said coating having a thickness between about 0.5 micron and about 2.5 microns and being highly absorbtive in the visible range.

5. A method of making a composite heating panel for a solar collector comprising the steps of

depositing a layer of dull nickel to a thickness of about 0.0005 inch on a surface of a high thermal conductivity substrate to lower the emissivity thereof, and

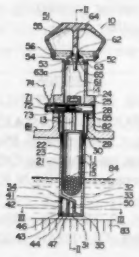
coating said layer of dull nickel with black chrome to a thickness between about 0.5 micron and about 2.5 microns to raise the absorbtivity of said surface in the visible range.

4,055,708

DEVICE FOR DETECTING THE OVERDISCHARGE OF AN ACCUMULATOR AS WELL AS THE SURFACE LEVEL OF THE LIQUID CONTAINED IN THE ACCUMULATOR

Mitsuo Yamamoto, Kakegawa, Japan, assignor to Ishikawa Tekko Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1976, Ser. No. 688,688
Claims priority, application Japan, May 27, 1975, 50-63612; Jan. 16, 1976, 51-4373
Int. Cl.[2] H01M *10/48*
U.S. Cl. 429—10 **12 Claims**



1. A device for detecing the overdischarge of the accumulator as well as the surface level of electrolyte contained in the accumulator comprising a floating member provided with a permanent magnet or a magnetic material, a case housing the floating member and having a hole through which the electrolyte in the accumulator passes, a means for sucking the electrolyte through the hole into the case and being attached to the case, a magnetically sensing switch arranged to be operated responding to movement of the permanent magnet or the magnetic material, and a valve means provided between the case and the electrolyte sucking means.

4,055,709

REJUVENATION OF NICKEL-CADMIUM BATTERY CELLS

Robert C. Medford, Newport News, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1976, Ser. No. 712,105
Int. Cl.[2] H01M *10/44*
U.S. Cl. 429—49 **6 Claims**

1. A method of rejuvenating nickel-cadmium battery cells of limited voltage capacity comprising the steps of:

charging the cells at approximately 2.5 amps until equilibrium is reached;

draining the electrolyte from the cells;

flushing the cells internally with demineralized-distilled water, which is free of carbon dioxide, in an ultrasonic bath;

preparing fresh electrolyte by dissolving approximately 33% by weight of reagent grade potassium hydroxide in boiled-distilled water; and

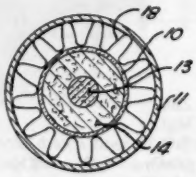
adding said fresh electrolyte to said cells.

4,055,710

ELECTROCHEMICAL CELLS HAVING SOLID ELECTROLYTE OF TUBULAR FORM

Geoffrey John May, Frodsham, and Michael McNamee, Wallasey, both of England, assignors to Chloride Silent Power Limited, London, England

Filed Oct. 1, 1976, Ser. No. 728,679
Int. Cl.[2] H01M *10/39*
U.S. Cl. 429—104 **27 Claims**



1. An electrochemical cell having a tube of solid electrolyte material separating a liquid alkali metal from a cathodic reactant, wherein constraining means are provided around the electrolyte tube, the constraining means having a coefficient of thermal expansion such as to provide an increasing inward pressure on the electrolyte tube as the temperature rises.

4,055,711

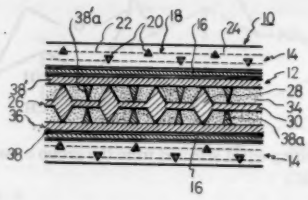
LEAD-ACID STORAGE BATTERY

Shinichi Ikari, Kumagaya, Japan, assignor to Masao Kubota, Tokyo, Japan

Continuation-in-part of Ser. No. 618,260, Sept. 30, 1975, abandoned. This application Jan. 24, 1977, Ser. No. 761,780
Claims priority, application Japan, Oct. 3, 1974, 49-113320
Int. Cl.[2] H01M *2/16*
U.S. Cl. 429—143 **7 Claims**

1. A lead-acid storage battery comprising positive plates and pasted negative plates, which are alternately arranged so that one of said positive and negative plates is disposed between the other of said plates, and insulating separators each being disposed between the adjacent positive and negative plates, char-

acterized by that each of said positive plates comprises a substrate having at least spaced longitudinal members of electrically conductive material with first and second outer surfaces of said spaced longitudinal members being substantially in first and second planes; pasted active material filled in said substrate substantially to the level of said first and second plane, respectively; and an active material holder including porous insulating sheets mounted on both sides of said active material, said insulating sheets each having an inner surface lying substantially in said first and second planes, respectively, and substan-



tially engaging said outer surfaces of said spaced longitudinal members, a plurality of longitudinal partitions of insulating material secured to said inner surfaces of said porous insulating sheets and interleaved with said longitudinal members, said plurality of longitudinal partitions extending inwardly from said inner surfaces and being embedded in said active material so as to effectively subdivide the active material into smaller active material portions, and whereby the said partitions and porous insulating sheets are effective in holding more securely the active material on the substrate during charge and discharge of the battery.

4,055,712

METHOD OF PREPARING CAPPED POLYMERS

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Kawanee Industries, Bryn Mawr, Pa.

Division of Ser. No. 623,402, Oct. 17, 1975, which is a continuation-in-part of Ser. No. 518,596, Oct. 29, 1974, Pat. No. 3,931,319. This application Sept. 27, 1976, Ser. No. 726,580

Int. Cl.[2] C08G *61/00*; C08F *110/00*

U.S. Cl. 526—11.1 **7 Claims**

1. A method of making a capped polymer which comprises condensing a difunctional tertiary amine with a greater than molar equivalent amount of a 1,4-dihalo-2-butene, and then, after extracting the unreacted dihalo compound, reacting the condensation product with a monofunctional heterocyclic tertiary amine to form a linear polymer having a quaternary ammonium moiety at each end.

4,055,713

IODINE MOLECULAR WEIGHT REGULATORS IN SUSPENSION POLYMERIZATION SYSTEMS

George A. Moczygemba; W. Delmar Johnson, and Earl Clark, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 510,040, Sept. 27, 1974, Pat. No. 3,983,187, which is a continuation of Ser. No. 303,330, Nov. 3, 1972, abandoned. This application May 13, 1976, Ser. No. 686,200

Int. Cl.[2] C08F *12/06, 18/04, 20/12, 20/42*

U.S. Cl. 526—207 **16 Claims**

1. In an aqueous suspension polymerization system, wherein at least one polymerizable monomer polymerizable under aqueous suspension polymerization conditions is polymerized under aqueous suspension polymerization conditions, including water, suspending agent, and in the presence of a molecular weight modifier, optionally with a free radical initiator, wherein said polymerizable monomer comprises a monovinyl-substituted aromatic compound, α,β-unsaturated nitrile, ester of acrylic acid, ester of alkacrylic acid, or vinyl ester, the improvement which comprises the step of employing elemental iodine as said molecular weight modifier.

4,055,714

AZO FREE RADICAL INITIATORS CONTAINING ULTRAVIOLET LIGHT STABILIZING GROUPS

Chester S. Sheppard, Kenmore, and Ronald E. MacLeay, Williamsville, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 435,622, Jan. 22, 1974, abandoned, which is a division of Ser. No. 98,893, Dec. 16, 1970, abandoned. This application Apr. 27, 1976, Ser. No. 680,545

Int. Cl.[2] C08F *4/04, 4/34, 12/08*

U.S. Cl. 526—208 **4 Claims**

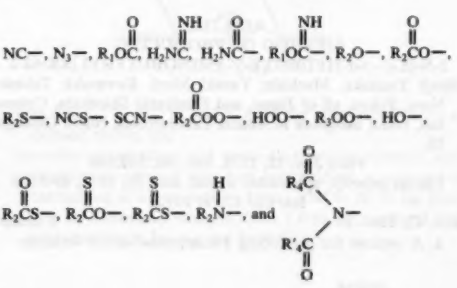
1. In the process of preparing a polymer containing an ultraviolet light stabilizer chemically bound to said polymer comprising polymerizing an ethylenically unsaturated monomer capable of being polymerized by free radicals in the presence of a free radical initiator the improvement comprising polymerizing said monomer in the presence of a free radical initiator containing ultraviolet light stabilizing groups and having the formula:

$$R—N{=}N—R'$$

wherein

R′ is selected from the group consisting of alkyl of 1–20 carbons, cycloalkyl of 3–10 carbons, aralkyl of 7–20 carbons and

wherein: Y is selected from the group consisting of



wherein

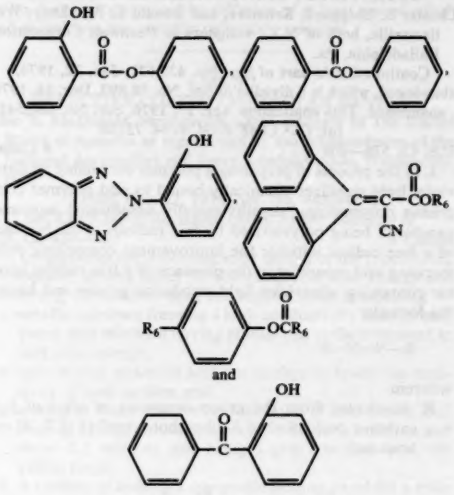
R_1 and R_2 are selected from the group consisting of alkyl of 1–20 carbons, cycloalkyl of 3–6 carbons, and alkylene of 2–30 carbons when R_1 and R_2 are joined together; and wherein one but not both of R_1 and R_2 may in addition be phenyl, tolyl, xylyl, benzyl, or phenethyl;

R_3 is t-alkyl of 4–8 carbons, t-cycloalkyl of 4–8 carbons or t-aralkyl of 9–15 carbons;

R_4 and R'_4 are alkyl of 1–6 carbons, cycloalkyl of 3–6 carbons or aryl of 6–12 carbons, when R_4 and R'_4 are joined together, and alkylene of 1–6 carbons or arylene of 6–12 carbons when R_4 and R'_4 are joined together;

R is any of the foregoing radicals of R′, and in addition, may be selected from the group consisting of aryl of 6–14 carbons, acyl of 2–20 carbons, aroyl of 7–20 carbons, carbamoyl, alkylcarbamoyl of 2–7 carbons, cycloalkylcarbamoyl of 4–11 carbons, $—CO_2NA$, $—CO_2K$, alkoxycarbonyl of 2–7 carbons, cycloalkoxycarbonyl of 4–11 carbons, and aryloxycarbonyl of 7–13 carbons, with the proviso that when R is carbamoyl, R′ can be, in addition,

alkoxycarbonyl of 2–7 carbons, cycloalkoxycarbonyl of 4–11 carbons, or aryloxycarbonyl of 4–11 carbons and at least one of R and R′ contains an ultraviolet light stabilizing radical of a compound selected from the group consisting of



and

where R_6 is alkyl of 1–6 carbons.

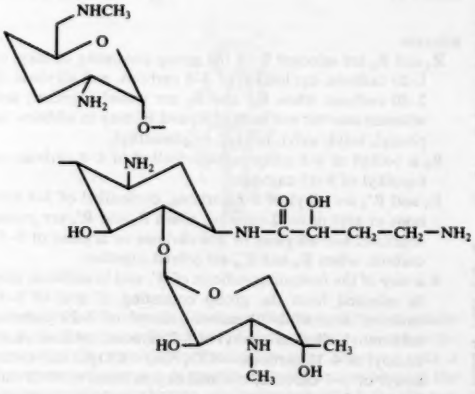
4,055,715

METHOD OF PRODUCING 1-N-[L-(−)-α-HYDROXY-γ-AMINOBUTYRYL]XK-62-2

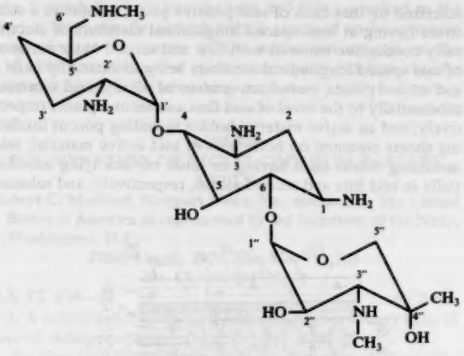
Shinji Tomioka, Machida; Yasuki Mori, Kawasaki; Takashi Nara, Tokyo, all of Japan, and Kunikatsu Shirahata, Columbus, Ohio, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jan. 22, 1975, Ser. No. 542,950
Claims priority, application Japan, Jan. 24, 1974, 49-9733
Int. Cl.[2] C07H *15/22*
U.S. Cl. 536—17 **6 Claims**

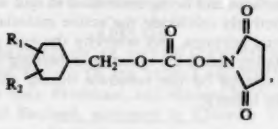
1. A process for producing a compound of the formula:

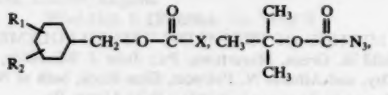


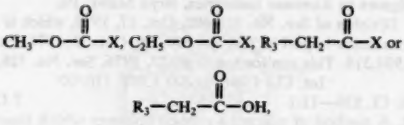
which comprises reacting a compound of the formula:

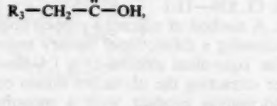


with an acylating agent selected from the group consisting of:

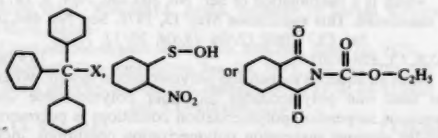




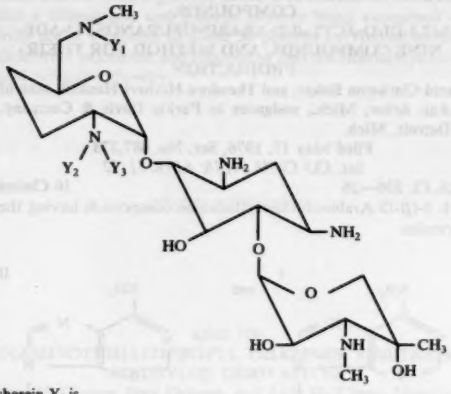




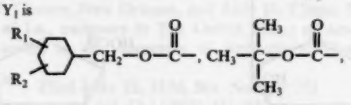
wherein R_1 and R_2 may be the same or different and are H, OH, NO_2, Cl, Br, I, alkyl groups having 1 to 5 carbon atoms or alkoxy groups having 1 to 5 carbon atoms, respectively, $R_3$is H, F, Cl, Br, I or an alkyl group having 1 to 5 carbon atoms and X is Cl, Br or I; or an amino protecting reagent selected from the group consisting of:

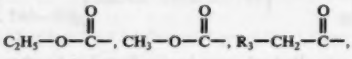


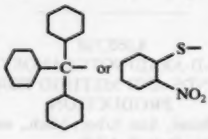
wherein X has the same significance as defined above to introduce an eliminable protecting group to the amino group bound to the carbon atoms at the 2′ **and** 6′ positions to prepare a first intermediate compound represented by the formula



wherein Y_1 is

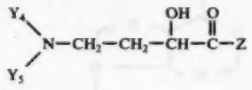




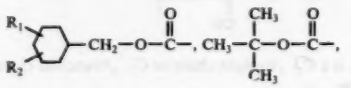


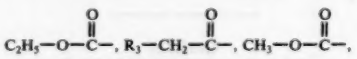
wherein R_1, R_2 and R_3 have the same significance as defined above, Y_2 has the same significance as Y_1 and Y_3 is hydrogen, or Y_2 and Y_3 form a phthaloyl group;

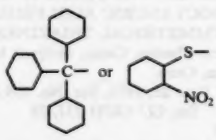
acylating said first intermediate compound with an acylating agent derived from α-hydroxy-γ-aminobutyric acid represented by the formula:



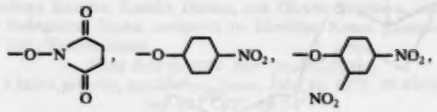
wherein Y_4 is H and Y_5 is

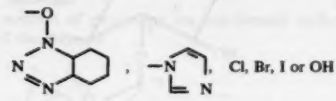




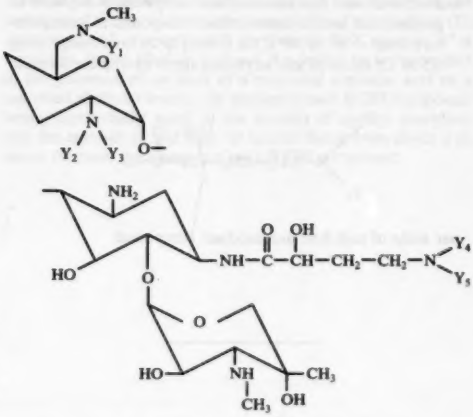


wherein R_1, R_2 and R_3 have the same significance as defined above or Y_4 and Y_5 form a phthaloyl group; and Z is



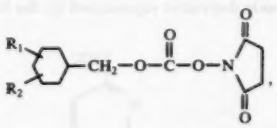


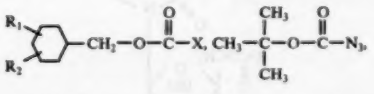
to prepare a second intermediate compound represented by the formula:

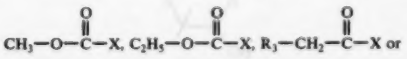


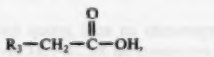
wherein Y_1, Y_2, Y_3, Y_4 and Y_5 have the same significance as defined above; and

thereafter eliminating said protecting groups wherein said reaction to prepare said first intermediate compound is carried out at a temperature from −50° to 50° C for from ½ to 24 hours and wherein from 1.0 to 4.5 moles of said acylating agent having the formula

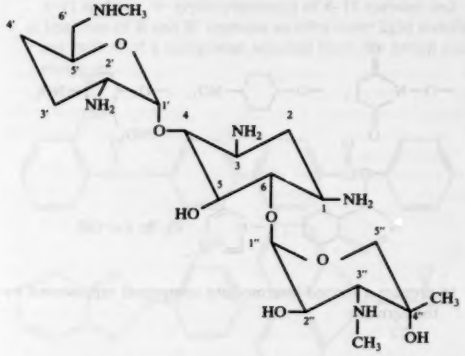




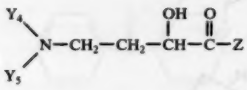




or said amino protecting reagent is employed per mole of



and wherein said first intermediate compound is acylated to prepare said second intermediate compound at a temperature from −50° to 50° C for from ¼ to 24 hours employing 0.5 to 1.5 moles of said acylating agent having the formula



per mole of said first intermediate compound.

4,055,716

N⁴ACYL-1-ARABINOFURANOSYLCYTOSINE-5′-ESTERS

Torao Ishida; Takashi Shirai, and Minoru Akiyama, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

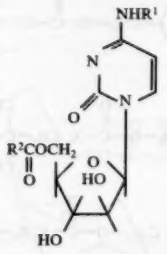
Filed Apr. 8, 1976, Ser. No. 675,050

Claims priority, application Japan, Apr. 8, 1975, 50-41815; Apr. 8, 1975, 50-41816

Int. Cl.² C07H *19/06*

U.S. Cl. 536—23 **5 Claims**

1. A nucleoside derivative represented by the formula:



wherein R^1 represents an acyl group having 3 to 28 carbon atoms and R^2 represents an XCH_2-, XCH_2CH_2— or CH_3CHX-group, wherein X represents chloro, bromo, a $(CH_3)_2N$-group or a $(C_2H_5)_2N$-group.

4,055,717

9-(3-O-ACYL-β-D-ARABINOFURANOSYL)ADENINE COMPOUNDS, 9-(2,3-DI-O-ACYL-β-D-ARABINOFURANOSYL)-ADENINE COMPOUNDS, AND METHOD FOR THEIR PRODUCTION

David Clarkston Baker, and Theodore Herbert Haskell, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

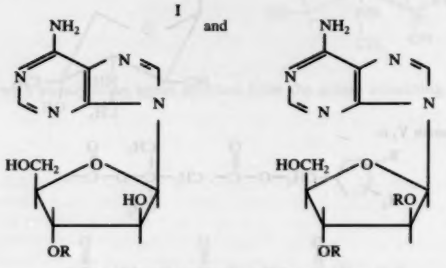
Filed May 17, 1976, Ser. No. 687,273

Int. Cl.² C07H *19/18;* A61K *31/52*

U.S. Cl. 536—26 **10 Claims**

1. 9-(β-D-Arabinofuranosyl)adenine compounds having the formulas

I and II



where R is an alkanoyl group having from 2 to 4 carbon atoms.

4,055,718

9-(2-O-ACYL-β-D-ARABINOFURANOSYL)-ADENINE COMPOUNDS AND METHOD FOR THEIR PRODUCTION

David Clarkston Baker, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

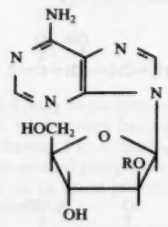
Filed May 17, 1976, Ser. No. 687,271

Int. Cl.² A61K *31/52;* C07H *19/18*

U.S. Cl. 536—26 **4 Claims**

1. A 9-(2-O-acyl-β-D-arabinofuranosyl)adenine compound having the formula

I



where R is a C_{2-4} straight chain or C_{3-4} branched chain alkanoyl group.

4,055,719

PROCESS FOR PRODUCING TRICHLOROISOCYANURIC ACID FROM SELECTED SYMMETRICAL TRIAZINES

John A. Wojtowicz, Chesire, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed June 25, 1976, Ser. No. 699,825

Int. Cl.² C07D *251/28*

U.S. Cl. 544—190 **7 Claims**

1. A process for producing trichloroisocyanuric acid by the reaction of a solid symmetrical triazine compound selected from the group consisting of ammeline, chlorosubstituted

ammeline, ammelide, chlorosubstituted ammelide, and mixtures thereof with a gaseous mixture of dichlorine monoxide and a diluent gas, said gaseous mixture being comprised of from about 1 percent to about 30 percent by volume of said dichlorine monoxide, and recovering said trichloroisocyanuric acid produced thereby.

4,055,720

DIAMINOTRIHALOPROPYL TRIAZINES: AND THEIR METHYLOL DERIVATIVES

Leon H. Chance, New Orleans, and Judy D. Timpa, Metairie, both of La., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 25, 1976, Ser. No. 689,771
Int. Cl.[2] C07D *251/48*
U.S. Cl. 544—205 **4 Claims**

1. 2,4-Diamino-6(3,3,3-tribromo-1-propyl)-1,3,5-triazine.

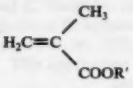
4,055,721

METHOD OF PRODUCING UNSATURATED CARBONYL COMPOUNDS

Noboru Kawata; Kosaku Honna, and Hirozo Sugahara, all of Sodegaura, Japan, assignors to Idemitsu Kosan Company, Ltd., Tokyo, Japan

Filed July 6, 1976, Ser. No. 702,987
Claims priority, application Japan, July 10, 1975, 50-84010
Int. Cl.[2] C07C *69/54*
U.S. Cl. 560—207 **10 Claims**

1. A method of producing an unsaturated carbonyl compound of the formula



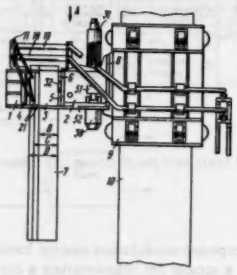
wherein R′ is hydrogen or lower alkyl, which comprises reacting methyl acetylene, carbon monoxide and a compound of the formula R′OH wherein R′ is hydrogen or lower alkyl in the presence of a catalyst consisting essentially of a palladium (II) compound and a compound of the formula R″X wherein R″ is hydrogen, lower alkyl or aryl and X is iodine or bromine, and in the presence of an ester of a saturated aliphatic acid or a saturated aliphatic ketone, the amount of said R′OH compound being substantially equal to the amount of methyl acetylene and the amount of said ester or ketone being from about 2 to about 10 times the amount of said R′OH compound.

4,055,722

ELECTRODE HOLDER

Jury Sergeevich Lukyanov, ulitsa Bljukhera, 35, kv. 51; Lev Seliverstovich Kazantsev, ulitsa Rimskogo-Korsakova, 11, kv. 69; Andrei Grigorievich Pomeschikov, ulitsa Rimskogo-Korsakova, 10, kv. 2, and Gennady Fedorovich Skvortsov, prospekt Karla Marxa, 25, kv. 26, all of Novosibirsk, U.S.S.R.

Filed Mar. 11, 1976, Ser. No. 665,933
Int. Cl.[2] H05B *7/102, 7/103*
U.S. Cl. 13—16 3 Claims



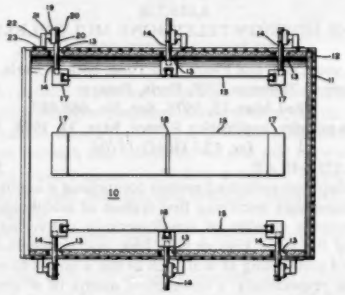
1. An electrode holder for holding electrodes of different types and sizes comprising: a casing for the electrode holder; a cantilever head having recesses and said head is connected to said casing; at least one electrode aedapted to be installed in said recesses of said cantilever head; electroconducting contact plates with current-feeding pipes secured on one of the walls of said cantilever head; said contact plates are provided with replaceable inserts made from electroconducting material, the thickness thereof depending on the thickness of said electrode to be installed; and each of said replaceable inserts having a cooling cavity communicating through said pipes for the delivery and discharge of a cooling fluid, with a corresponding cooling cavity of said contact plate and said current-feeding pipe.

4,055,723

HEATER SUPPORT ELEMENT FOR ELECTRIC FURNACE

Wallace Snow Vanderford, Kintnersville, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed July 19, 1976, Ser. No. 706,654
Int. Cl.[2] H05B *3/34*
U.S. Cl. 13—25 8 Claims



1. In an electric furnace having an electric heater formed of aflexible material, an improved electrical connecting and supporting element for said heater comprising

a bar of electrically conductive material having in a face thereof a longitudinal slot parallel with the longitudinal axis of said bar with the width of its entrance of lesser dimension than the width of the inner portion of said slot to receive within said slot a loop of said flexible electric heater, and

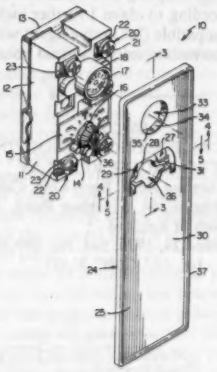
a mandrel having a cross-sectional dimension greater than said width of said entrance and less than said width of said inner portion of said slot inserted within said loop within said slot whereby said flexible material is mechanically secured to said bar of electrically conductive material and provides an electrical connection between said bar and said heater.

4,055,724

PROTECTIVE SHIELD FOR A CONTROL DEVICE

Siegfried E. Manecke, and James L. Shaw, both of Indiana, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 499,327, Aug. 21, 1974, Pat. No. 3,914,661.
This application Aug. 4, 1975, Ser. No. 601,514
Int. Cl.[2] H05K *5/03*
U.S. Cl. 174—66 7 Claims



2. A substantially flat protective shield for a control device having a housing provided with a selector knob and dial arrangement adjacent said knob as well as electrical terminal means adajcent said knob and dial arrangement, said protective shield being adapted to be secured to said control device to cover said terminal means, said shield having two separate opening means therethrough, one of said opening means being adapted to expose said dial arrangement and the other of said opening means being adapted to have said selector knob projecting therethrough, said shield having a web portion thereof separating said two opening means from each other, said web portion having a part thereof offset relative to said shield by another part thereof, said offset part of said web portion being disposed spaced from and parallel to said shield while being adapted to engage against said housing to space said shield therefrom.

4,055,725

CIRCUIT BOARD ASSEMBLY

Kenneth G. Boynton, Milford, N.H., assignor to Hollis Engineering, Inc., Nashua, N.H.

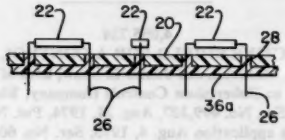
Division of Ser. No. 469,536, May 13, 1974, Pat. No. 3,973,322.
This application Feb. 2, 1976, Ser. No. 654,367
Int. Cl.[2] B23K *31/02;* H05K *3/20*
U.S. Cl. 174—68.5 19 Claims

1. A method of treating electrical and electronic components assembled in a perforated circuit board in preparation for mass joining with solder said electrical and electronic components by their leads to said board, and wherein said component leads extend through at least some of the perforations in said board, said method comprising the steps in sequence of:

a. applying a meltable cement to said board and said component leads so as to (1) at least partially cover at least some

of said perforations and (2) intimately contact (a) wall areas of said circuit board defining said perforations and (b) said leads extending through said perforations, said cement (i) being applied as a liquid,

said cement in solid form (ii) being compatible with said solder, and, (iii) having a melting point below that of said solder, and



b. hardening said liquid to form said solid, solder-compatible meltable cement, coupling said leads and said board.

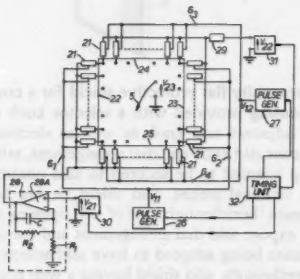
4. A method according to claim 1 further including the step of intermixing a compatible flux active agent with said cement and applying the intermix resulting to said board and component leads.

4,055,726

ELECTRICAL POSITION RESOLVING BY ZERO-CROSSING DELAY

John A. Turner, 13 Station Road, Earls Coln, Colchester, Essex, and Gordon J. Ritchie, 44 Wivenhoe Road, Alresford, Colchester, Essex, both of England

Filed June 24, 1976, Ser. No. 699,381
Int. Cl.² G08C 21/00
U.S. Cl. 178—18 **8 Claims**



1. An electrical position resolver arrangement, comprising

means defining a resistive surface,

at least two electrode means in electrical contact with the surface at points extending respectively along spaced-apart lines,

a movable probe for making electrical connections with the surface at a point between the said lines,

first and second sources respectively providing first and second voltges having substantially similar voltage/time waveforms which are separated by a predetermined time delay and each of which has at least a portion which is unmodulated and substantially linear,

connection means for respectively connecting the first and second voltages to said two electrode means, and

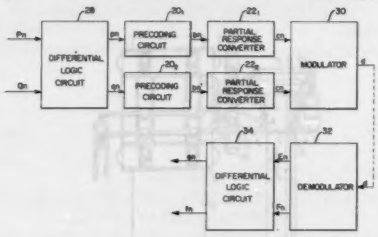
output means responsive to the voltage produced on the probe by the first and second voltages for determining the time delay between the time when the said portion of one of the first and second voltages crosses a datum value and the time when the probe voltage crosses the corresponding datum value, so as to sense the position of the probe relative to the two electrode means to which the first and second voltages are applied.

4,055,727

PARTIAL RESPONSE, QUADRATURE AMPLITUDE MODULATION SYSTEM

Tadayoshi Katoh, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 20, 1976, Ser. No. 716,098
Claims priority, application Japan, Aug. 20, 1975, 50-100759
Int. Cl.² H04L 15/00
U.S. Cl. 178—68 **6 Claims**



1. In a partial response modulation system having a receiver portion including a means for regenerating a carrier which is subject to phase ambiguity, and comprising in the transmitter portion thereof two pre-coding circuits for respectively pre-coding two parallel input signals and producing corresponding pre-coded output signals, two partial response converters for performing partial response conversion of the respective outputs of the said two pre-coding circuits and a modulator for amplitude modulating quadrature-related carriers of a common frequency with said two partial response converter outputs and producing a quadrature amplitude modulated output, the improvement comprising:

processing means, including a differential logic circuit and means for receiving said two parallel input signals and detecting when the combination code of said two parallel input signals is such as not to be influenced by the 90° phase ambiguity of the regenerated carrier during demodulation in a receiving means, thereupon to apply said two parallel input signals directly to said respective two pre-coding circuits, and for detecting when the combination of said two parallel input signals codes is such as will be influenced by the 90° phase ambiguity of the said regenerated carrier during demodulation, thereupon to apply said two parallel input signals to said differential logic processing means prior to processing of said two parallel input signals by said respective two pre-coding circuits.

4,055,728

FINE DIVISION TELEPHONE MULTIPLEXED SWITCHING NETWORK

Robert Lyon-Caen, and Pham Ngu Tung, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 19, 1976, Ser. No. 668,687
Claims priority, application France, Mar. 21, 1975, 75.08944
Int. Cl.² H04Q 11/04
U.S. Cl. 179—15 AT **5 Claims**

1. A telephone switching system comprising n inputs capable of simultaneously receiving first frames of telephonic signals and n outputs capable of simultaneously delivering second frames of the same kind as said first, and connection means capable of connecting at will each of the n inputs to each said n outputs respectively, a connection matrix of n^2 connection points for connecting always one input to one output and one only, each of said connection points being a two-state bistable element, said element being blocked in one of said states and conducting in the other, and having a control input for triggering them from one state to the other, a connection memory comprising p columns of n^2 two-state bistable elements, each having an output, said control inputs being connected to said $p \times n^2$ outputs, a shift register addressing said p columns succes-

sively and cyclically, a control memory of n^2 control elements having respective outputs, enabling the states of the p elements

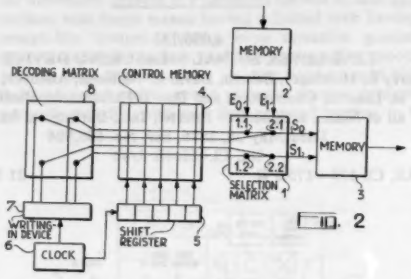


FIG. 2

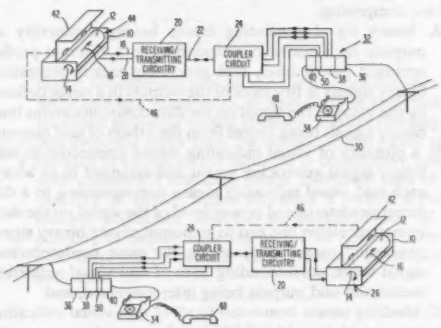
of a column to be triggered from one state to the other at any instant.

4,055,729

APPARATUS FOR THE DIRECT CONNECTION OF ANCILLARY EQUIPMENT TO A TELEPHONE NETWORK

John M. Vandling, Pleasantville, N.Y., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed May 24, 1976, Ser. No. 689,263
Int. Cl.[2] H04M *1/00, 9/00*
U.S. Cl. 179—2 C **45 Claims**



20. Apparatus for direct coupling a telephone set and ancillary equipment to a telephone network comprising:

first circuit means providing a first communication current path through said telephone set and said network;

second circuit means providing a second communication current path through said ancillary equipment and said network;

third circuit means providing a third control current path through said telephone set and said network simultaneously with said second communication current path;

control means for selectively completing said first current flow path or said second current flow path; and

sensor means for sensing the magnitude of current flow in said third current flow path;

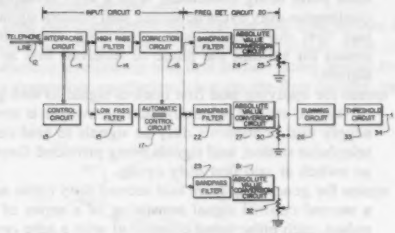
said control means being responsive to said sensor means so as to selectively complete said first current flow path and break said second current flow path in response to sensing said open circuit in said third current flow path.

4,055,730

CIRCUIT FOR DETECTING DIAL PULSES

Gary N. Stapleford, Londonderry, and Joel E. Sandahl, Derry, both of N.H., assignors to Comex Systems, Inc., Hudson, N.H.

Filed May 29, 1975, Ser. No. 581,731
Int. Cl.[2] H04M *1/50*
U.S. Cl. 179—84 VF **25 Claims**



1. A circuit for correlating an incoming sequence of pulses and a known pulse pattern, said correlation circuit comprising:

receiving means for transmitting a sequence of probable pattern pulses in response to the incoming sequence of pulses, each probable pattern pulse corresponding to the incoming pulses,

pattern means for providing, in a timed sequence, a plurality of control signals which correspond to the known pulse pattern, said receiving means enabling said pattern means to transmit the control signals in response to each probable pattern pulse,

means responsive to a first probable pattern pulse in the sequence for synchronizing the operation of said pattern means and the probable pattern pulses, and

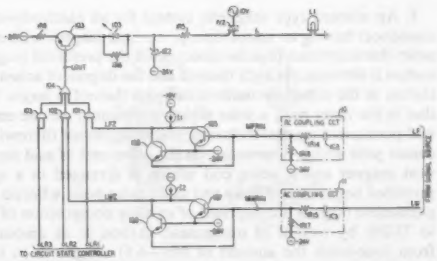
correlation means responsive to said control signals transmitted by said pattern means upon receipt of successive probable pattern pulses from said receiving means for indicating whether the incoming pulse sequence correlates to the known pulse pattern.

4,055,731

KEY TELEPHONE LAMP CONTROL CIRCUIT

Ronald Joseph Angner, Freehold, and James Volney Lacy, Red Bank, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 28, 1976, Ser. No. 708,846
Int. Cl.[2] H04M *1/72*
U.S. Cl. 179—99 **2 Claims**



2. A line circuit for use in a key telephone system where a plurality of different ac lamp signals, each having a different duty cycle indicative of a particular circuit state, are provided to a connected telephone station, said line circuit having supplied thereto a source of ac signals having a continuous duty cycle and a first phase, and a source of ac signals having a first duty cycle and said first phase,

the improvement comprising

means, including a solid state ac switch, having a power input terminal connected to said continuous duty cycle ac signals, and having a power output terminal for providing said ac lamp signals to said connected telephone station, and having a gate terminal for controlling the passage of said ac signals through said ac switch,

means for generating from said first duty cycle ac signals a first control signal consisting of a series of discrete pulses, each pulse being coincident with a zero crossing of said continuous duty cycle ac signal, said control signal having said first duty cycle, said generating means including means for shifting the phase of received first ac voltage signals,

means for applying said first control signal to said gate lead of said ac switch whereby said ac switch is enabled to supply said continuous duty ac signals to said connected telephone station, said signals being provided through said ac switch at said first duty cycle,

means for generating from said second duty cycle ac signals a second control signal consisting of a series of discrete pulses, each pulse being coincident with a zero crossing of said continuous duty cycle ac signal, said control signal having said second duty cycle,

means for applying said second control signal to said gate lead of said ac switch whereby said ac switch is enabled to supply said continuous duty ac signals to said connected telephone station said signals being provided through said ac switch at said second duty cycle, and

means for selectively enabling said first and said second control signal applying means.

4,055,732

INBOARD TYPE MAGNETIC SYSTEM FOR ELECTRO-DYNAMIC TRANSDUCER

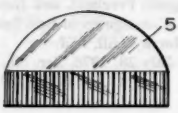
Hisashi Yoshimura, Minoo; Sadao Yukimoto, Neyagawa; Takashi Matsumoto, Hirakata; Isago Konno, Neyagawa; Nobuyuki Kato; Tadao Ohtani, both of Katano, and Takao Kubo, Kawachiangnao, all of Japan, assignors to Matsushita Electric Industrial Company Limited, Osaka, Japan

Filed Dec. 2, 1975, Ser. No. 636,960

Claims priority, application Japan, Dec. 2, 1974, 49-139322

Int. Cl.[2] H04R *9/02;* **B21C** *23/00;* **C22C** *22/00*

U.S. Cl. 179—117 **2 Claims**



1. An inboard type magnetic system for an electrodynamic transducer having an anisotropic permanent magnet with magnetic characteristics that the direction of the preferred magnetization is between the ends thereof and the degree of anisotropization in the outer circumferential part thereof is larger than that in the inner part, a yoke which is mounted on one end of said permanent magnet to form a magnetic circuit therewith, a center pole which is mounted on the other end of said permanent magnet and a voice coil which is arranged in a space provided between said yoke and said center pole, wherein said permanent magnet is comprised of an alloy composition of 68.0 to 73.0% by weight of manganese, carbon in an amount of from (one-tenth the amount of Mn—6.6) weight % to (one-third the amount of Mn—22.2) weight %, and the remainder aluminum, and said magnet being of a magnetic material which has been subjected to warm extrusion at a temperature in the range of 620° - 750° C through a conical die which has extrusion ratio of 2.5 to 12 and semiangle of 5° to 15° for giving it anisotropic magnetic characteristics with the direction of the preferred magnetization in the direction of the warm extrusion and for making the degree of anisotropization in the outer circumferential part of said permanent magnet larger than that in the inner part, whereby the magnetic system can be made thin.

4,055,733

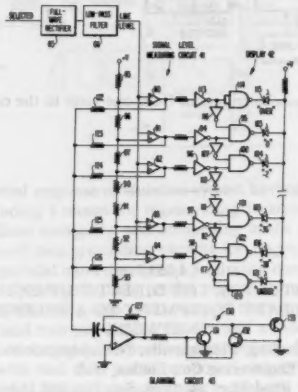
LINE LEVEL SIGNAL MEASURING DEVICE

Jerry L. Holsinger, Boston; David E. Williams, Andover; Frank B. Lezotte, Chelmsford, and Don I. Falkenstein, Burlington, all of Mass., assignors to Intertel, Inc., Burlington, Mass.

Filed May 28, 1976, Ser. No. 690,884

Int. Cl.[2] H04B *3/46*

U.S. Cl. 179—175.3 R **21 Claims**



1. A device for providing a measurement that represents the power level of a complex, alternating-current signal being conveyed over a data communications line, said measurement device comprising:

A. binary signal generating means having a plurality of outputs, each output corresponding to a different predetermined power level, said generating means generating binary signals at first ones of the outputs in a range defined by the value of the signal on the data communications line, binary signals being absent from the others of said outputs,

B. a plurality of visual indicating means connected to said binary signal generating means and arranged in an array, each said visual indicating means corresponding to a different predetermined power level of the signal on the data communications line and to an output of said binary signal generating means representing the same predetermined signal value, corresponding ones of said visual indicating means and said outputs being interconnected, and

C. blanking means connected to all of said visual indicating means and to said binary signal generating means for disabling said visual indicating means upon sensing a predetermined condition of the signal on the data communications line.

4,055,734

KEYBOARD SWITCH ASSEMBLY WITH HINGED PUSHBUTTONS AND CANTILEVERED TERMINAL MEMBERS

Thomas John Hayden, 2244 Mesa Verde Drive, Milpitas, Calif. 95035

Continuation of Ser. No. 428,348, Dec. 26, 1973, abandoned. This application July 11, 1975, Ser. No. 594,981

Int. Cl.[2] H01H *13/14;* **G06C** *7/02*

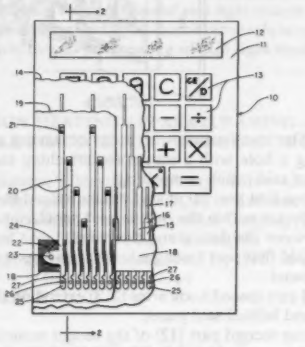
U.S. Cl. 200—5 A **4 Claims**

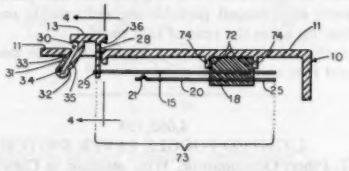
1. A keyboard switch assembly comprising:

a panel member having an upper surface and a plurality of pushbutton apertures,

an equal plurality of pushbuttons,

hinge means integrally formed with said panel member and the associated pushbutton for securing the pushbutton to the panel and within the associated aperture for reciprocable movement therein in a direction normal to said upper surface, said hinge means having a folded web having a trough-like bottom opening in a direction generally toward said upper surface, said web having a first grooved portion extending along the junction between said hinge and said panel and a second grooved portion extending generally parallel with said first grooved portion in the





region between said bottom and the junction between said hinge and said pushbutton, at least some of said pushbuttons each including switch actuating means extending in a first direction away from the surface of said panel; and

a plurality of switch means mounted in cooperative relation with said switch actuating means, individual ones of said plurality of switch means including a switch actuating element positioned adjacent an associated one of said plurality of switch actuating means for operable connection therewith when the corresponding pushbutton is actuated.

4,055,735

TOUCH SENSITIVE DEVICE

Joseph J. Eachus, Cambridge, and Theodore S. Graff, Sudbury, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 23, 1975, Ser. No. 625,272
Int. Cl.² H01H *1/02, 13/70*
U.S. Cl. 200—5 A **11 Claims**

1. A touch sensitive device comprising:

a first layer of material having a plurality of denoted locations on a topmost surface;

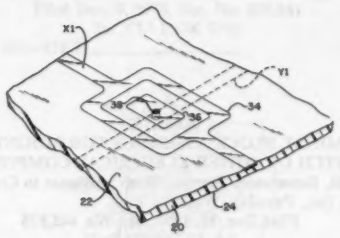
a second continuous layer of variable resistance flexible material positioned thereunder, said variable resistance flexible material being pressure sensitive so as to normally be high in resistance when not under an externally applied pressure and low in resistance only at a location that has been subjected to externally applied pressure; and

a third layer comprising a rigid circuit means for defining a plurality of touch sensitive locations said rigid circuit means being positioned underneath said second continuous layer of variable resistance flexible material, said rigid circuit means comprising:

a first plurality of parallel conductors oriented in a first direction and lying on a first surface of said rigid circuit means, each of said first plurality of conductors being in contact with said second continuous layer of variable resistance flexible material;

a second plurality of parallel conductors oriented in a second direction and lying on a second surface of said rigid circuit means; and

at least one conductive terminal on said first surface for each of said second plurality of conductors, each conductive terminal on said first surface being spaced from a respective conductor lying on the first surface, each



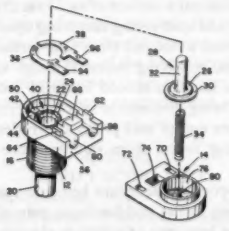
conductive terminal on said first surface moreover being in contact with said second continuous layer of variable resistance flexible material, said conductive terminals on said first surface combining with respective conductors lying on said first surface so as to define a plurality of potentially conductive paths through said second continuous layer of variable resistance flexible material said potentially conductive paths thereby defining a plurality of touch sensitive locations located underneath said plurality of denoted locations on the topmost surface of said first layer of material whereby application of a predetermined amount of externally applied pressure to a given denoted location will establish a conductive path thereunder.

4,055,736

PUSH SWITCH

Peter Congelliere, 3321Yale, Santa Ana, Calif. 92704

Filed Dec. 18, 1975, Ser. No. 641,734
Int. Cl.² H01H *13/04*
U.S. Cl. 200—16 A **12 Claims**



1. In a switch of the kind that includes a pair of electrically conductive contact elements and a plunger structure having an electrically conducting bridging surface, and means responsive to an actuating force for causing the plunger to be displaced such that said bridging surface is caused during successive actuations to assume a first position bridging said contact element, and a second position in which said bridging surface

is spaced from said contact elements, the improvement which comprises:

said contact elements comprising a pair of C-shaped members formed of sheet material disposed in a plane with the open portion of the C-shape of each facing the other such that togehter they define segments of an annulus incomplete at diametric points; and

said bridging surface comprising a circular member having an outer diameter greater than the inner diameter of said annulus and less than the outer diameter of said annulus;

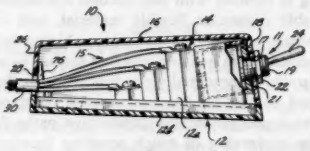
housing means in the form of a housing comprising a first housing member and a second housing member engaging respectively associated opoosite side of the outer peripheral portion of said annulus for retaining said C-shaped members in said plane and for guiding movement of said plunger structure.

4,055,737

TERMINAL BLOCK ASSEMBLY FOR MOUNTING A SWITCH OR OTHER ELECTRICAL COMPONENT

Harry R. Rasmussen, Tacoma, Wash., assignor to Crest Industries, Inc., Puyallup, Wash.

Filed Dec. 31, 1975, Ser. No. 645,825
Int. Cl.² H01H 9/02
U.S. Cl. 200—51 R **35 Claims**



1. An assembly of an electrical component and a terminal block, comprising:

an electrical component having a body and a substantially rigid electrical connection prong mechanically affixed to said body and projecting outwardly therefrom;

terminal connection means;

a base including structure formed of dielectric material that defines a terminal receiving recess and a prong receiving aperture, said terminal receiving recess having an opening through which said terminal connection means is inserted and having an interior wall extending inwardly of said base from said opening, said body of said component being mounted adjacent a surface of said base that is spaced from said recess and said prong receiving aperture being sized and positioned to extend from said surface and enter into said terminal receiving recess through said interior wall thereof at a location spaced inwardly from said opening, said prong being disposed in said prong receiving aperture so that a free end of said prong protrudes into said terminal receiving recess from said aperture in said interior wall;

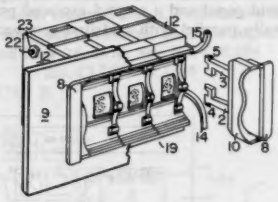
said terminal connection means being disposed in said terminal receiving recess and having a pair of prong gripping elements, at least one of which is electrically conductive, receiving said prong therebetween, and having tightening means coacting with said prong gripping elements for drawing said elements into mechanical and electrical engagement with said prong, said terminal connection means being sized and oriented with respect to both said terminal receiving recess and said prong receiving aperture so as to anchor said prong in said recess and thus secure said component to said base.

4,055,738

MULTIPLE SWITCH MOUNT

Herbert C. Beck, San Jose, Calif., assignor to Electronic Engineering Co. of California, Santa Ana, Calif.

Filed Mar. 19, 1976, Ser. No. 668,543
Int. Cl.² H01H 9/00
U.S. Cl. 200—296 **11 Claims**



1. The combination with a device having ends and a panel having a hole with a mount for attaching said device in the hole of said panel, comprising;

a. one first part **(1)** of said mount lodged at each end of said device within the hole in said panel,

between the device and the panel,

b. said first part having a lip **(8)** lying upon the front of said panel

and two spaced hook arms **(2, 3)** extending through said hole and behind said panel,

c. one second part **(12)** of the mount mounted upon each of the same said ends of the device behind said panel,

d. each said second part having an opening which receives both of said hook arms of a one said first part, and

e. each said second part having deformable ears **(14, 15)** bearing upon the rear of said panel,

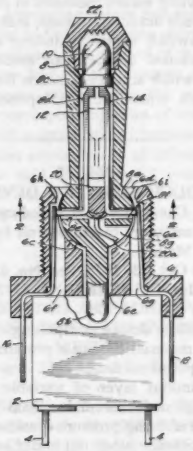
whereby said device is removably locked to said panel by said first and second parts.

4,055,739

LIGHTED TOGGLE LEVER SWITCH

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Aug. 19, 1976, Ser. No. 715,897
Int. Cl.² H01H 9/16
U.S. Cl. 200—315 **14 Claims**



1. In a switch having a housing enclosing contacts, the combination comprising:

a bushing at the top of said housing;

a toggle lever extending through said bushing and having a

middle portion pivotally mounted in said bushing, an inner portion for operating said contacts, and an outer portion having a central bore extending longitudinally therethrough to communicate with a pair of lateral holes extending oppositely outwardly through said middle portion coaxial with the pivotal axis of said toggle lever;

a pair of stationary terminals extending up through said bushing adjacent the outer ends of said lateral holes;

a light source having a pair of terminals extending longitudinally in said bore with bent portions extending laterally outwardly through said lateral holes to engage said stationary terminals, and

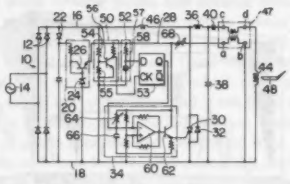
means maintaining electrical contact between said stationary terminals and said bent portions of said light source terminals and maintaining said light source terminals in spaced-apart relation to prevent shorting of said light source.

4,055,740

INDUCTION HEATING APPARATUS USING A SATURABLE REACTOR FOR POWER CONTROL PURPOSES

Masatatsu Nakamura; Hideyuki Kominami; Keizo Amagami; Takao Kobayashi, and Tadao Toyooka, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Company, Japan

Filed Mar. 15, 1976, Ser. No. 666,973
Claims priority, application Japan, Mar. 19, 1975, 50-34052
Int. Cl.[2] H05B *5/04*
U.S. Cl. 219—10.49 R **12 Claims**



1. An induction heating apparatus comprising:

a power converter adapted to connect to a source of alternating voltage for converting the frequency of the source voltage to a high frequency, including a gated switching device, a resonant circuit including an induction heating coil connected to the gated switching device, a gating circuit providing gating-on pulses that drive said gated switching device into conduction successively, whereby an energization current substantially at said higher frequency is produced in said induction heating coil, a zero crossover detector for detecting the instant when said alternating voltage is substantially at zero to trigger said gating circuit to generate a train of gating-on pulses, first delay means for delaying the generation of said gating-on pulses for a predetermined period from the instant when said power converter is connected to the alternating voltage source, whereby said induction heating coil is electromagnetically coupled to a magnetic cooking ware placed in overlying relation therewith to be heated;

a transformer having a closed magnetic circuit and provided with three parallel limbs connected together by transverse members, a control winding arranged on the central limb and series-connected load windings wound in opposite directions and arranged one on each outer limb and connected in series with said induction heating coil to thereby be energized by said energization current, said transformer including an air gap in each of said outer limbs so that the variation of a current through said control winding linearly alters the magnitude of the current passing through said load windings; and

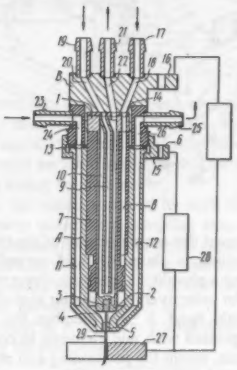
a power control circuit comprising means for detecting electrical power representative of said electromagnetic coupling, means for comparing the detected power with a reference value to produce a DC control current with which said control winding is energized, manually adjusting means for controlling said reference level, and second delay means connected between said comparing means and said control winding for delaying the application of said DC control current for a predetermined period from the instant when said power converter is connected to said source voltage for energization.

4,055,741

PLASMA ARC TORCH

David Grigorievich Bykhovsky, Konjushenny pereulok, 1/16, kv. 18; Alexandr Yakovlevich Medvedev, ulitsa Kalyaeva, 3, kv. 17; Jury Alexandrovich Bogorodsky, prospekt Mechnikova, 14, kv. 163; Vladimir Nikolaevich Firsov, ulitsa Gribaleva, 12, kv. 50, and Yakov Vulfovich Rossomakho, Bolshoi prospekt, 27/1, kv. 40, all of Leningrad, U.S.S.R.

Filed Dec. 8, 1975, Ser. No. 638,941
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 P **7 Claims**



1. A plasma arc torch of a two-part design and comprising two detachable and tightly joined first and second parts mating with each other; the first part containing and rigidly interconnecting: an electrode holder, an electrode mounted in said electrode holder, a nozzle with a cylindrical passage disposed coaxially of said electrode; means for supplying an electric current to said nozzle; an electrical insulator located between said electrode holder and said nozzle; passages for a plasma-generating gas and coolant being brought out into the surface mating with said second part; said second part accommodating: means for supplying an electric current to said electrode holder; means for supplying the coolant through passages to said electrode holder and said nozzle; means for supplying the plasma-generating gas through said passages; said passages of said second part being brought out into the mating surface in such a manner that they match with corresponding passages of said first part on the surface of the joint thereof, whereby said first part may be disconnected from said second part thereby simultaneously removing said electrode and said nozzle.

4,055,742

HARD FACING ROD

Harry J. Brown, Lewiston, N.Y.; William D. Forgeng, Las Vegas, Nev., and Charles M. Brown, Lewiston, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 472,048, May 21, 1974, abandoned. This application June 23, 1976, Ser. No. 698,846
Int. Cl.[2] B23K *35/22*
U.S. Cl. 219—145 **2 Claims**

1. A hard facing rod comprising a metal sheath containing a hard facing material in the form of finely divided particles consisting essentially of (i) at least one type of vanadium carbide (ii) tungsten in solid solution with each type of vanadium

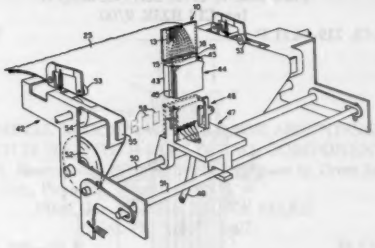
carbide in said composition in an amount from about 10% by weight up to about 67% by weight (iii) cobalt in an amount up to about 50% by weight of said composition; the aggregate amount of all vanadium carbides in said composition being at least about 10% by weight of said composition.

4,055,743

ELECTROTHERMAL PRINT HEAD

Renato Conta, Ivrea (Turin); Lucio Montanari, Cascinette (Turin), and Riccardo Brescia, Ivrea (Turin), all of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Division of Ser. No. 512,564, Oct. 7, 1974, Pat. No. 3,967,092.
This application Apr. 9, 1976, Ser. No. 675,352
Claims priority, application Italy, Oct. 23, 1973, 70117/73
Int. Cl.² H05B *1/00*
U.S. Cl. 219—216 **3 Claims**



1. In a non-impact dot-matrix printer of the type comprising: a recording medium, a platen for said recording medium, a print head having a plurality of printing elements and a pattern of conductors for selectively energizing said elements, a support carrying said head, a base member for mounting said support in said printed with said elements in contact with said recording medium, means for positioning and removably fixing said support to said base member, said means comprising:

a plurality of conductive laminae for contacting said conductors of said pattern when said head is positioned in said base member, releasable latching means for latching said support to said base member, and

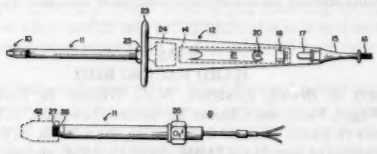
manually operable means for releasing said latching means to remove said support from said base member.

4,055,744

ELECTRICALLY HEATED SOLDERING-DESOLDERING INSTRUMENTS

William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 91402

Filed July 16, 1975, Ser. No. 596,395
Int. Cl.² H05B *1/02, 3/42;* B23K *3/02, 3/04*
U.S. Cl. 219—239 **3 Claims**



1. In a soldering instrument:

a substantially cylindrical, thin-walled stainless steel sheath having a reduced diameter front end formed with both internal and external threads which are coaxial with said sheath and having hexagonal nut formed integrally with its rear portion;

a substantially cylindrical, highly heat conductive heater cartridge disposed coaxially within said sheath and an externally threaded front end threadingly engaged with said internal threads of said sheath;

an internally threaded soldering tip disposed in threaded engagement over said external threads of said sheath whereby

said front end of said heater cartridge and the threaded portion of said soldering tip are axially coincident and in high thermal energy flow relationship with each other; and

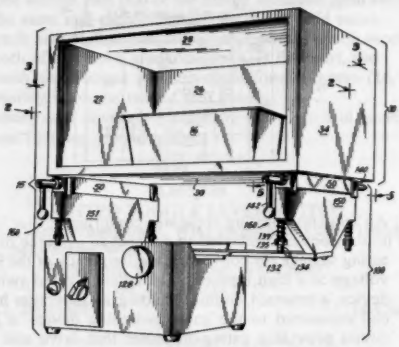
a heater element of the character to be electrically energized disposed within said cartridge in direct thermal contact therewith.

4,055,745

FOOD COOKING OVEN

Rodolfo Rodriguez Balaguer, 2607 Grace Drive, Harbor Beach, Fort Lauderdale, Fla. 33316

Filed Apr. 20, 1976, Ser. No. 678,486
Int. Cl.² F27D *11/02*
U.S. Cl. 219—406 **22 Claims**



1. A food cooking oven which comprises:

a. exterior side, bottom, top and back walls;

b. a thermally insulated door closing the front of said oven;

c. interior walls spaced inwardly from said exterior walls and defining the interior of said oven, said oven interior having a volume of at least, approximately, 0.25 cubic feet, said exterior and interior walls together defining a substantially rigid, self-supporting structure, said interior walls being electrically conductive;

d. thermal and electric insulation means disposed between said interior and exterior walls; and

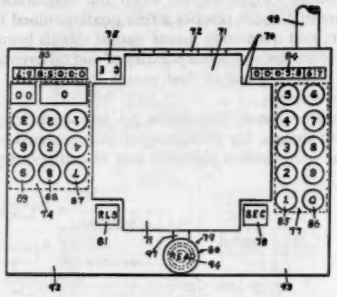
e. a pair of rigid, spaced apart, electrical contact members, said contact members being secured to and in electrical contact with at least one of said interior walls and extending along a substantial portion of the depth of said oven and extending outwardly through and beyond the adjacent exterior wall, each of said contact members being adapted to be received within a respective one of a pair of clamps which are connected to a low voltage, high current power supply whereby a non-hazardous, low voltage is impressed across said contacts and thereby an electrical current flows through said interior walls in an amount sufficient to heat the interior of said oven to a food cooking temperature.

4,055,746

METHOD OF AND APPARATUS FOR SECURING AND STORING PERSONAL INFORMATION

Glen Peterson, 540 S. 83rd East Ave., Tulsa, Okla. 74112

Filed Nov. 7, 1969, Ser. No. 874,760
Int. Cl.[2] G06K 7/08, 19/06
U.S. Cl. 235—61.7 B 3 Claims



1. An electronic computer system comprised of more than one substantially indentical computers each of which includes means for reading and writing binary indicia representative of characters, means for storing information, means for programming said stored information, computer energizing means, alphabetical work writing means and decimal number writing means, said means for storing information comprised of two portions: a first portion of which is permanently contained within each of said computers and fixed with respect to geographic location; a second portion of which is not permanently contained in any of said computers and is not fixed with respect to geographic location, said second portion comprised of a multiplicity of cards retained and controlled by a multiplicity of individuals, and from time to time placed by said individuals in said means for reading and writing binary indicia representative of characters of said computers, with joint means privided within said cards, each of said computers and said computer system for a secure programmed release of information stored on said cards into said first portion of said storage means for storing information, each of said cards comprised of thin parallel sheet members in close proximity to each other, at least one of said sheet members comprised of ferromagnetic substance, said sheet member of ferromagnetic substance comprised of two thin sheets of ferromagnetic material in contact with each other, one of said thin sheets composed of ferromagnetic material having a wide hysteresis loop and a large coercive force, and the highest possible resudual magnetism consistent therewith, the second of said thin sheets composed of ferromagnetic material having a narrow hysteresis loop, a small coercive force and high permeability.

4,055,747

APPARATUS AND METHOD FOR THE SYNCHRONOUS READING OF DATA FROM A PUNCHED CARD

Olav V. Jensen, West Vancouver, Canada, assignor to Ebco Industries, Ltd., Richmond, Canada

Filed May 13, 1976, Ser. No. 686,242
Int. Cl.[2] G06K 7/10; G08C 8/06; G06K 7/08
U.S. Cl. 235—61.11 E 15 Claims

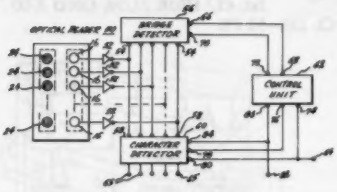
15. The method of synchronously determining the information character encoded as one or more punched data locations of at least one columnar region of a card being moved past an array of sensors wherein each sensor supplies an electrical signal indicative of whether a punched or unpunched card region is currently passing by said sensor comprising the steps of:

a. performing a first periodic sampling of each signal supplied by said array of sensors to detect the time at which an unpunched card region has reached each sensor following the onset of said first periodic sampling;

b. performing a second periodic sampling of each signal supplied by said array of sensors following the detection that an unpunched region has reached each sensor during said first periodic sampling;

c. comparing the signal sample supplied by each of said sensors at a first predetermined sampling time during said second periodic sampling with the signal sample supplied by the same sensor at the nextmost antecedent sampling time of said second periodic sampling;

d. detecting when one of said sensors supplies a signal at said first predetermined sampling time during said second periodic sampling that indicates an unpunched card region passing by said sensor and the same one of said sensors supplies a signal at said nextmost antecedent sampling time of said second periodic sampling that indicates a punched region is passing by said sensor;



e. supplying said signal supplied by each of said sensors at said nextmost antecedent sampling time of said second periodic sampling as a digital word representative of the information character encoded in that columnar region of said card passing by said sensors at said first sample time of said second periodic sampling; and

f. repeating steps *a*, *b*, *c*, *d* and *e* until said card has passed completely by said sensors.

4,055,748

COMPUTING WEIGHING SCALE

Edwin E. Boshinski, Englewood; Robert C. Meckstroth, Dayton, and Robert M. Rogers, Troy, all of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Dec. 15, 1975, Ser. No. 641,140
Int. Cl.[2] G01G 23/22; G06F 9/16
U.S. Cl. 364—466 18 Claims

1. In a weighing scale having total price computing capability having

a platter,

means for generating code information corresponding to weight of a commodity on said platter including an output for such information,

display means including a multi-digit numerical indicator,

means for generating code information corresponding to price per unit weight including an output for such information,

calculating means having an input connected to accept each said weight code information and said price per unit weight information from said outputs and being operable to multiply the two into a product in code information defining the total price of the weighed commodity,

said calculating means also having an output for the total price code information,

indicator means associated with said display means and operable to indicate to what a number displayed by said numerical indicator corresponds,

control means associated with said calculating means for causing said calculating means to interrogate said means for generating weight code information and said means for generating price per unit weight information and to multiply the weight information entered in said calculating

means by the entered price per unit weight; the improvement comprising

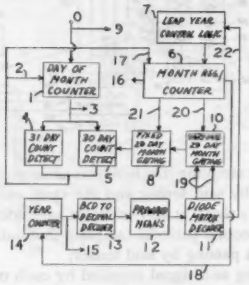
said control means also including means for causing display at different times of numbers corresponding to at least two of said outputs on the same digit positions of said numerical indicator in a predetermined sequence and to actuate said indicator means to denote the type of information displayed on said numerical indicator.

4,055,749

ELECTRONIC HEBREW CALENDAR AND DATE CALCULATOR

Jonathan Moses Kraushaar, Annandale, Va. 22003

Filed Nov. 26, 1976, Ser. No. 745,243
Int. Cl.[2] H03K *21/36*; G09D *3/00*
U.S. Cl. 235—92 PE **12 Claims**



1. A self-contained electronic device capable of accurately tracking and displaying the month, day and year of the Hebrew calendar, in the presence of all regular and subtle irregular yearly variations in several of its months over any multiple year period comprising: a month counting and displaying means for indicating twelve calendar months plus a thirteenth leap month, a day counting means for displaying the day of the month and resettable to one after a count of thirty days, except when an external input is present which causes it to reset after twenty-nine days, a day gating means which provides a logic signal to the day counting means causing it to reset for twenty-nine day months, a year counting means for counting and displaying the last digit of the calendar year, a memory means which takes the output of the year counting means and decodes it into outputs which determine the length of yearly varying months and control for the presence of a leap month, a connecting means which provides an appropriate reset condition to the day counter through the day gating means when twenty-nine day months are indicated by the month counter, a connecting means for advancing the month counter when the day counter is reset, a connecting means between the memory means and day gating means to control the day counter for months which vary between twenty-nine and thirty days, and a connecting means between the memory and month counting means to allow the month counting means to count to thirteen for leap years and to twelve for regular years.

4,055,750

HEADING SENSOR FOR VEHICLE DEAD RECKONING SYSTEM

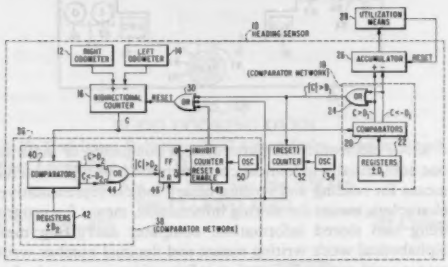
Ernest Jellinek, Haddonfield, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 7, 1976, Ser. No. 694,043
Int. Cl.[2] G06F *15/50*
U.S. Cl. 364—424 **10 Claims**

1. An apparatus for determining the heading of a vehicle with respect to a reference direction, said vehicle having a major longitudinal axis and a minor transverse axis, said system being of the type including first means for resettably generating a differential count indicative of the difference in distance traveled by first and second predetermined points on said vehicle, said differential count having a polarity in accordance with a predetermined convention, said first and second predetermined points being positioned at substantially equal distances from said transverse axis and separated by a predetermined distance in a direction parallel to said transverse axis; wherein the improvement comprises:

quantizing means, responsive to said differential count, for generating output signals when the magnitude of said differential count reaches a first predetermined threshold value; said quantizing means output signals being indicative of the instantaneous polarity of said differential count, and being applied to first means to reset said distance count to zero;

accumulator mans, responsive to said quantizing means output signals, for generating an output signal indicative of the accumulated algebraic sum of said polarity signals;



first resetting means, responsive to said differential count, for generating an output signal when the average rate of accrual of increments of said differential count over a first predetermined time period does not exceed a first predetermined rate of accrual; and

second resetting means, responsive to said differential cou for generating an output signal when the average rate accrual of increments of said differential count over a second predetermined time period does not exceed a second predetermined rate of accrual; said second time period being no greater than said first time period, said first and second resetting means output signals being applied to said first means to reset said differential count to zero.

4,055,751

PROCESS CONTROL SYSTEM FOR THE AUTOMATIC ANALYSIS AND REGENERATION OF GALVANIC BATHS

Egon Bussmann, Munich; Bruno Flamme, Neuried, both of Germany; Jacky Vanhumbeeck; Johannes Helder, both of Brugge, Belgium, and Hubert De Steur, Drongen, Belgium, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 12, 1976, Ser. No. 685,804
Claims priority, application Germany, May 13, 1975, 2521282
Int. Cl.[2] G01N *27/00*; G06F *15/46*
U.S. Cl. 364—500 **14 Claims**

1. A process control system for monitoring the chemical composition of bath liquid for a plurality of baths, in particular metal depositing baths, said process control system comprising:

a main programmer for operating the control system through a sequence of program steps;

a bath selection programmer connected to said main programmer and to the baths for selecting baths for analysis;

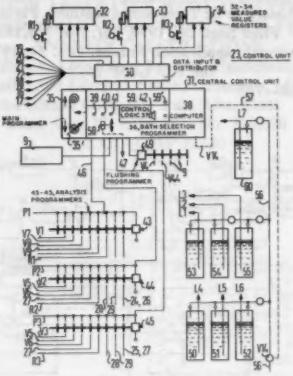
a chemical component analyzer including a plurality of constituent analyzing sections for anayzing respective quantities of respective bath constituents;

a plurality of analysis programmers connected to said analyzer and connected to and operated by said bath selection

programmer to connect selected baths to appropriate analyzer sections;

a supply of bath correcting fluids;

comparison means connected to said analyzer to compare the analyzed actual quantities with respective reference quantities; and



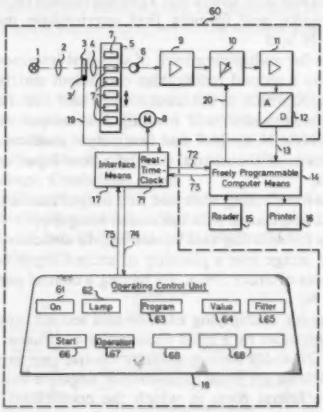
adjusting means connected to said comparison means and connected between said supply and the plurality of baths for supplying correcting fluids to the respective baths in accordance with the differences between the actual and reference quantities.

4,055,752

METHOD AND APPARATUS FOR THE DETERMINATION OF ENZYME ACTIVITY

Walter Kappe, Oberkochen; Götz-Reinhard Lampe, Heidenheim, and Harald Neuer, Oberkochen, all of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Wurttemberg, Germany

Filed Jan. 31, 1975, Ser. No. 546,144
Claims priority, application Germany, Feb. 7, 1974, 2405810
Int. Cl.[2] G06F *15/42*
U.S. Cl. 364—551 **17 Claims**



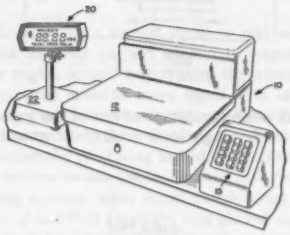
15. In combination in enzyme activity determining means, light source and light detector means for determining relative light transmissivity of a sample disposed therebetween, means for repetitively sampling the output of said detector means at spaced points in time relatively large in comparison to the inter-sample interval for any said point in time, computer means for receiving said sampled detector output signals, said computer means including means for determining statistical light transmissivity for the samples at any point in time, means for fitting a curve to said statistical properties determined by said means therefor, and means for determining the derivative of said curve determined by said curve fitting means.

4,055,753

COMPUTING WEIGHING SCALE

Robert M. Rogers, Troy, and Edwin E. Boshinski, Englewood, both of Ohio, assignors to Hobart Corporation, Troy, Ohio

Filed Dec. 15, 1975, Ser. No. 641,139
Int. Cl.[2] G01G *23/22;* G06F *9/16*
U.S. Cl. 364—466 **50 Claims**



1. In a weighing scale for computing the total value of an article being weighed from a weight input and a price per unit weight input, said scale having

an article receiving platter,

a weighing system including a weight responsive mechanism connected to said platter and including an electrical weight signal output means,

sensing means responsive to changing weight,

computing means operatively connected to said weighing mechanism for receiving the weight output signal,

means for providing a price per unit weight signal to said computing means for computing total value from the weight and price per unit weight signals, and

digital numerical display means for visually displaying numbers identifying the weight, the price per unit weight, and the total price of a given article on the platter upon entry of price per unit weight and computation of the weight times the price per unit weight;

the improvement comprising

said numerical display means including one multidigit number display connected to show sequentially at least two of said numbers and selectively operable indicator means identifying the number shown on said one display, and

sequencer means returning said one display to the beginning of its sequence in response to a change in weight after having once become stabilized and causing the sequence to repeat as far as it progressed prior to such change.

4,055,754

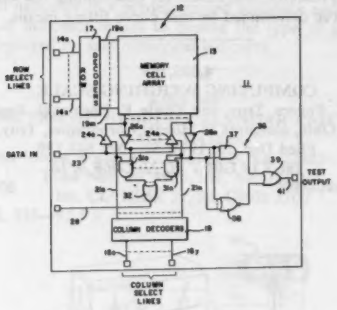
MEMORY DEVICE AND METHOD OF TESTING THE SAME

Gilman D. Chesley, 22431 Starling Drive, Los Altos, Calif. 94022

Filed Dec. 22, 1975, Ser. No. 642,765
Int. Cl.[2] G11C *29/00;* G06F *11/00*
U.S. Cl. 235—302.3 **3 Claims**

1. In an integrated circuit memory device: a plurality of memory cells, means for writing data into and reading data out of the memory cells, first coincidence gate means responsive to data read simultaneously out of a group of the memory cells for determining whether all of the data from said group is of a first logic level, second coincidence gate means responsive to data read simultaneously out of the group of cells for determining whether all the data from said group is of a second

logic level, and output gate means responsive to the outputs of the first and second coincidence gate means for delivering an



output signal when the data read out of the group of cells is either all of the first logic level or all of the second logic level.

4,055,755

SWITCHING ASSEMBLY IN COMBINATION WRISTWATCH AND CALCULATOR

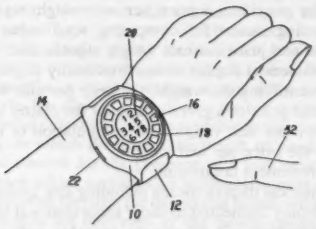
Tutomu Nakamura, Akashi; Takehiko Sasaki, Yamatokoriyama; Masaji Yonekawa, Sakurai, and Hidetoshi Maeda, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 15, 1976, Ser. No. 677,441

Claims priority, application Japan, Apr. 16, 1975, 50-52299[U]; Apr. 18, 1975, 50-53886[U]

Int. Cl.[2] G06F *15/02, 7/38;* **G04B** *47/00;* **H01H** *35/00*

U.S. Cl. 364—705 **2 Claims**



1. A combination wristwatch and calculator including a conductive casing, a front insulating panel, a time keeping circuit, an arithmetic calculation circuit, a key input means for introducing desired information into the arithmetic calculation circuit, and an information display for displaying information stored in the time keeping circuit and the arithmetic calculation circuit, said key input means comprising:

a plurality of touch electrodes formed on the front insulating panel; and

a plurality of touch sensitive electronic switching circuits, each of the touch sensitive electronic switching circuits including;

a C-MOS inverter circuit having a gate terminal and two power supply terminals,

a power source connected across said power supply terminals,

two input terminals connected to one of said touch electrodes and to said conductive casing, respectively, and

circuit means for inverting the condition of said C-MOS inverter circuit when said two input terminal are connected to each other through a human body resistor.

4,055,756

IMAGE CODER-DECODER USING A MATRIX TRANSFORM WITH WEIGHTED CONTRIBUTION OF SEVERAL POINTS OF THE IMAGE TO THE FORMATION OF ONE POINT OF THE TRANSFORM

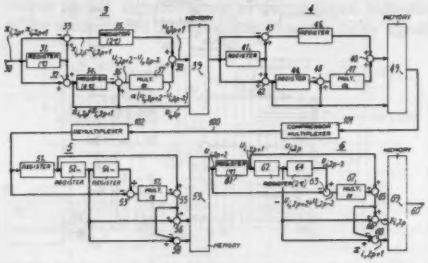
Jean-Claude Jolivet, St. Michel en Greve, and François-Xavier Antoine Stouls, Perros Guirec, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Sept. 30, 1976, Ser. No. 728,189

Claims priority, application France, Oct. 24, 1975, 75.3262

Int. Cl.[2] G06F *15/34*

U.S. Cl. 364—725 **5 Claims**



1. A matrix transform system for coding images with weighted contribution of several points of the image to each points of the coded image and for decoding coded images with weighted contribution of several points of the coded image to each point of the decoded image, said system comprising:

a. means for sampling the lines of an image to be coded and forming with said image samples a square matrix associated with the image;

b. means for splitting said square matrix associated with the image into a plurality of first input component matrices of order $3N \times 3N$ having a central part of order $N \times N$;

c. means for multiplying each of said first input component matrices by a first rectangular coefficient matrix of order $N \times 3N$ having a square central part in which the coefficients are equal to positive or negative unity and two square lateral parts in which the coefficients are selectively equal to zero and $\pm \alpha$ where α is a predetermined factor smaller than unity, and forming first intermediate matrices of order $N \times 3$

d. means for multiplying each of said first intermediate matrices by a second rectangular coefficient matrix of order $3N \times N$ which is the transpose of said first rectangular coefficient matrix, and forming first output matrices of order $N \times N$, each of said first output matrices being the transform of the central part of a first input component matrix;

e. means for forming with said first output matrices a square matrix associated with the coded image;

f. means for splitting said square matrix associated with the coded image into a plurality of second input component matrices of order $3N \times 3N$ having a central part of order $N \times N$;

g. means for multiplying each of said second input component matrices by a third rectangular coefficient matrix of order $N \times 3N$ having a square central part in which the coefficients are equal to positive or negative unity and two square lateral parts in which the coefficients are selectively equal to zero and (a) $\pm \alpha$ where α is said predetermined factor smaller than unity and forming second intermediate matrices of order $N \times 3N$;

h. means for multiplying each of said second intermediate matrices by a fourth rectangular coefficient matrix of order $3N \times N$ which is the transpose of said third rectangular coefficient matrix and forming second output matrices of order $N \times N$, each of said second output matrices

being the transform of the central part of a second input component matrix; and

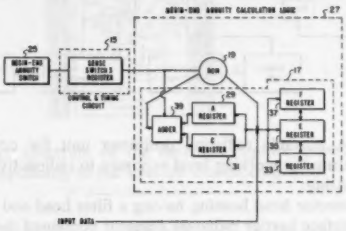
i. means for forming with said second output matrices a square matrix associated with the decoded image.

4,055,757

CALCULATOR APPARATUS WITH ANNUITY SWITCH FOR PERFORMING BEGIN-AND END-PERIOD ANNUITY CALCULATIONS

Lynn W. Tillman, Los Altos; Kent R. Henscheid, Sunnyvale, both of Calif., and Larry D. Smith, Damascus, Md., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 27, 1976, Ser. No. 718,290
Int. Cl.[2] G06F *15/30*
U.S. Cl. 364—715 4 Claims



1. An apparatus for performing annuity calculations with payments due at one of the beginning and end of each payment period, said apparatus comprising:

switch means manually settable to one of a first and second positions; and

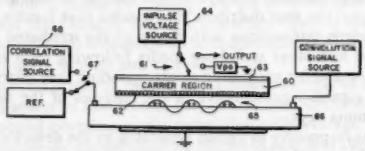
processing means coupled to said switch means and coupled to receive input data for performing selected annuity calculations with payment due at one of the beginning and end of each payment period, calculations with payment due at the beginning of each payment period being performed by automatically converting the input data to produce substitute data and mathematically manipulating the substitute data in response to the switch means being set to the first position, and calculations with payment due at the end of each payment period being performed by mathematically manipulating the input data in response to the switch means being set to the second position.

4,055,758

SURFACE WAVE DEVICES FOR PROCESSING SIGNALS

Ernest Stern, Concord; Richard C. Williamson, Framingham; Abraham Bers, Arlington, and John H. Cafarella, Swampscott, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 555,367, March 5, 1975, Pat. No. 4,016,412.
This application Mar. 31, 1976, Ser. No. 672,345
Int. Cl.[2] G06G *7/19*; H04R *17/00*
U.S. Cl. 364—821 6 Claims



1. A device for processing and storing signals comprising

a first piezoelectric substrate capable of propagating acoustic wave signals on a selected surface thereof;

at least one transducer means formed on said selected surface for generating surface acoustic waves traveling on said surface along a selected direction thereof in response to electrical signals;

a semiconductor material positioned so as to have a first surface thereof adjacent and spaced from said selected surface of said first substrate, said semiconductor material including a carrier region having a plurality of carriers and a trap region having a plurality of traps substantially at or near said first surface, said trap region forming an interaction region at or near said first surface;

a layer of conductive material disposed on a second surface of said semiconductor material, said layer forming an electrode;

means for providing a first signal at said at least one transducer means to produce a first traveling acoustic wave signal along said selected surface of said first substrate; and

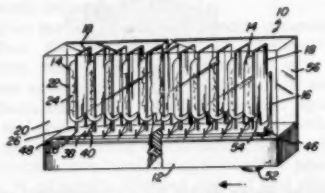
means for applying a second signal to said semiconductor material to cause carriers therein to migrate from said carrier region to said trap region, the interaction of said first traveling acoustic wave signal with said carriers in said trap region thereby causing said carriers to fill said traps and to be retained therein in a selective stationary pattern thereby producing said altered stationary conductivity pattern in said semiconductor material as said first traveling acoustic wave signal travels along said selected surface of said first substrate, said altered stationary conductivity pattern being stored in said semiconductor material and representing the interaction of said first and second signals.

4,055,759

SIGNAL DEVICE USING PERCUSSIVE FLASHLAMPS

Andre C. Bouchard, Peabody; Harold H. Hall, Jr., Marblehead; Renaldo Mercaldi, Beverly, and Thomas J. Sentementes, Wakefield, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 14, 1976, Ser. No. 696,107
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—159 9 Claims



1. A signal device intended for hand operation comprising, in combination:

a support member;

a plurality of percussively-ignitable flashlamps mounted on said support member;

a plurality of preenergized strikers mounted on said support member and releasable to fire said flashlamps;

movable means retained in said support member in operative alignment with respect to said strikers and adapted to be directly actuated by hand; and,

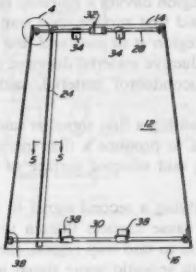
means provided on said movable means for sequentially releasing said preenergized strikers to fire respective ones of said flashlamps in response to successive hand indexing of said movable means.

4,055,760

LAMP SHADE

Alfred L. Weisbrod, 1214 Valley Road, Villanova, Pa. 19085

Filed Jan. 20, 1976, Ser. No. 650,596
Int. Cl.[2] F21V 1/00
U.S. Cl. 362—352 8 Claims



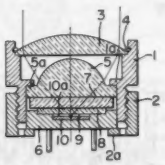
1. A lamp shade adapted to be shipped in a flat disassembled condition for subsequent assembly comprising two rings, a flat cover sheet of self supporting material, said rings having a plurality of members circumferentially disposed thereon, each of said members being adapted to be adhesively secured to a juxtaposed portion of said cover sheet with the rings in spaced relation, said members being pivotably secured to their respective rings and slidable along their respective rings, and means to join the free edges of said sheet.

4,055,761

LIGHT RECEIVING DEVICE FOR PHOTOELECTRIC CONVERSION ELEMENT

Jun Shimomura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,733
Claims priority, application Japan, Mar. 14, 1975, 50-33417[U]
Int. Cl.[2] H01J 5/02, 39/12
U.S. Cl. 250—239 7 Claims



1. A light receiving device for a photoelectric conversion element, comprising:

a. transparent covering means for covering said conversion element to exclude presence of air between said conversion element and said covering means;

b. a transparent, elastic sheet positioned on said covering means;

c. a light converging optical system for converging light beams incident on said photoelectric conversion element, said optical system including a lens positioned on said sheet, said lens, said sheet and said covering means being similar in refractive index; and

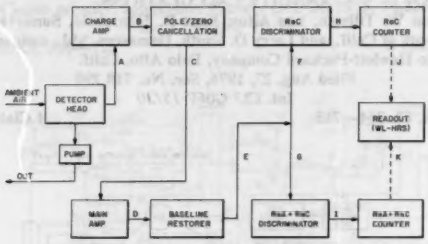
d. means for tightening together said covering means, said sheet and said lens whereby air is excluded from between the contacting surfaces of said covering means and said sheet, and the contacting surfaces of said sheet and said lens.

4,055,762

RADON DAUGHTER DOSIMETER

John Durkin, Bethel Park, Pa., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Mar. 25, 1976, Ser. No. 670,213
Int. Cl.[2] G01V 5/00
U.S. Cl. 250—253 8 Claims



1. A portable radiation dosimeter unit for continuously measuring the working level exposure to radioactive particles comprising:

a detector head housing having a filter head and solid state surface barrier radiation detector contained therein;

said head housing having an ambient air inlet and outlet adapted to allow air to flow through said filter head before contacting said radiation detector;

an air pump to force ambient air into said head housing inlet to the filter and radiation detector;

electronic circuitry connected to said radiation unit for receiving and processing charged electrons received therefrom by converting them to pulses whose heights are representative of the energy levels of detected radioactive particles, said circuitry having means for discriminating and counting the pulses of different heights; and

a portable self contained power supply operatively connected to said pump and electronic circuitry.

4,055,763

NEUTRON CHARACTERISTIC AND SPECTROSCOPY LOGGING METHODS AND APPARATUS

Stephen Antkiw, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 563,359, March 31, 1975, abandoned.
This application May 17, 1976, Ser. No. 686,781
Int. Cl.[2] G01V 5/00
U.S. Cl. 250—270 47 Claims

1. Apparatus for investigating earth formations traversed by a well bore, comprising:

a well tool adapted to be moved through the well bore;

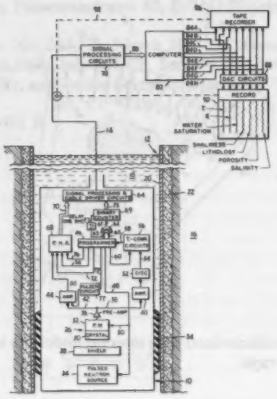
means carried by the well tool for irradiating the formation and other well bore media surrounding the well tool with at least two time-spaced pulses of fast neutrons;

detector means carried by the well tool for detecting at least in part the time distribution of gamma rays resulting from neutron interactions with nuclei of the irradiated formation and other well bore media following each neutron pulse and for generating a corresponding time distribution of signals representative of the energies of the detected gamma rays;

means responsive to signals generated by the detector means following the first of said neutron pulses for selecting a portion of the time distribution of signals following the second of said neutron pulses which corresponds to gamma rays resulting predominantly from thermal neutron capture interactions with nuclei of the irradiated formation; and

means responsive to the detector signals within the selected

portion of the time distribution of signals following said second neutron pulse for analyzing at least a portion of the



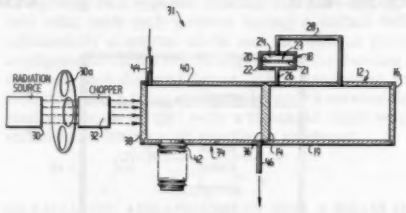
energy spectrum of the detected capture gamma rays corresponding to the selected detector signals.

4,055,764

OPTICALLY SELECTIVE, ACOUSTICALLY RESONANT GAS DETECTING TRANSDUCER

John Dimeff, San Jose, Calif., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 22, 1975, Ser. No. 643,043
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—336 **7 Claims**



1. Gas detection apparatus comprising:

a. a first chamber having a quantity of gas *x* therein, said chamber having an acoustic resonant frequency;

b. a second chamber with a pressure responsive diaphgram dividing said chamber into first and second parts, said diaphragm having a mechanical resonant frequency approximately equal to the acoustic resonant frequency of said first chamber;

c. first coupling means for coupling the gas in said first chamber to said first part of said second chamber; said first coupling means permitting said gas pressure variations in said first chamber having a frequency equal to said acoustic resonant frequency to be transmitted to said first part of said chamber and said diaphragm;

d. second coupling means for coupling the gas in said first chamber to said second part of said second chamber, said second coupling means permitting only average and low frequency gas pressure variations in said first chamber to be transmitted to said second part of said second chamber and said diaphragm;

e. a third chamber containing an unknown gas in which gas *x* may be present;

f. a source of electromagnetic radiation that is intensity modulated at a frequency equal to said acoustic resonant frequency, said radiation including at least one spectrum that corresponds to an absorption spectrum of gas *x;*

g. said third chamber having opposed end sections that are at least transparent to said spectrum, and said first chamber having at least one wall section that is at least transparent to said spectrum;

h. said third chamber being positioned between said radiation source and said first chamber and said chambers being oriented to enable said electromagnetic radiation to pass through said third chamber and into said first chamber; and

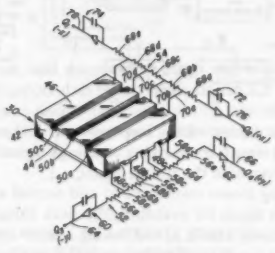
i. means for measuring the amplitude of the excursions of said diaphragm, said amplitude being representative of the amount of gas *x* in said third chamber.

4,055,765

GAMMA CAMERA SYSTEM WITH COMPOSITE SOLID STATE DETECTOR

Mark S. Gerber, Columbus, and Don W. Miller, Westerville, both of Ohio, assignors to The Ohio State University, Columbus, Ohio

Filed Apr. 27, 1976, Ser. No. 680,755
Int. Cl.[2] G01T *1/22*
U.S. Cl. 250—370 **22 Claims**



1. A composite solid state detector for use in deriving a display, by spatial coordinate information, of the distribution or radiation emanating from a source thereof situate within a region of interest, comprising:

a plurality of solid state detector components, each having a given surface arranged for exposure to impinging radiation and exhibiting discrete interactions therewith at given spatially definable locations;

said given surface of each said detector component and the surface disposed opposite and substantially parallel thereto, respectively, being associated with impedance means configured to provide, for each of said opposed surfaces, outputs for impedance defined signals relating the said given location of said interactions with one spatial coordinate parameter of one select directional sense;

said detector components being arranged to provide groupings of adjacently disposed ones of said given surfaces mutually linearly oriented to exhibit a common said directional sense of said spatial coordinate parameter; and

means interconnecting at least two of said outputs associated with each of said surfaces within a given said grouping thereof for collecting said impedance defined signals deriving therefrom.

4,055,766

CONTROL SYSTEM FOR GAMMA CAMERA

Don W. Miller, Westerville, and Mark S. Gerber, Columbus, both of Ohio, assignors to The Ohio State University, Columbus, Ohio

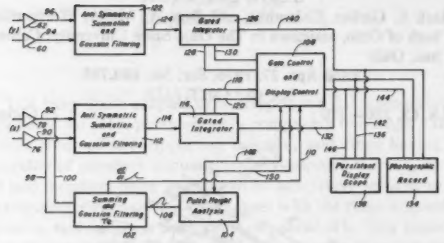
Filed Apr. 27, 1976, Ser. No. 680,754
Int. Cl.[2] G01T *1/22*
U.S. Cl. 250—370 **29 Claims**

1. In a system for imaging the distribution of a radiation

emitting isotope within a region of interest, said system including solid state strip array type detector means having strip regions which are operatively associated with impedance networks, said networks being arranged to receive radiation-induced charges in spatial disposition corresponding with the interaction location of said radiation upon said strips, said charge receipt being time variant in correspondence with said position of interaction to exhibit a collection time constant, τ_D, the improvement comprising:

amplifier means coupled with said impedance network means and having output signals corresponding with said charge receipt;

first summing means responsive to said amplifier means output signals for deriving a spatial signal corresponding to the spatial orientation of a said interaction location;



second summing means responsive to said amplifier means output signals for deriving an energy signal of value corresponding with the spatial signal;

evaluating means responsive to said second summing means energy signal for evaluating the peak value of said energy signal over a time, t_e, and having a select output when said energy signal peak value lies within predetermined limits;

means for intergrating said spatial signal over a time, t_i, to derive an integrated spatial signal, said time, t_i, being greater than said time t_e;

readout means responsive, when actuated, to receive said integrated spatial signal and derive perceptible information corresponding thereto; and

control means for regulating an operational cycle of said system including the actuation of said readout means only upon the occurrence of said evaluating means select output.

4,055,767

DETECTION APPARATUS FOR X-RAY TOMOGRAPHY

Robert Allemand, Saint Ismier, France, assignor to Commissariat a l'Energie Atomique, Paris, France

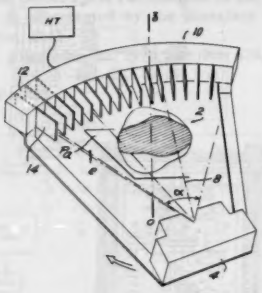
Filed June 4, 1976, Ser. No. 692,735

Claims priority, application France, June 19, 1975, 75.19263

Int. Cl.² G01T *1/18*

U.S. Cl. 250—385 **9 Claims**

1. Detection apparatus for use with X-ray tomography apparatus comprising at least one X-ray source adapted to emit X-ray beams to pass through an organ to be analyzed and to thereupon be intercepted by said detection apparatus which comprises multicellular ionization chambers constituted by a single comb-type anode formed by a substantially cylindrical first plate p and a plurality of flat plates P_i at right angles to said plate P and a plurality of cathodes C_i, each being formed by a plate which is parallel to one of said plates P_i, each of said chambers comprising two substantially parallel anode and cathode electrodes separated by a radiation-detecting medium adapted to convert the incident X-rays to electron-ion pairs, a voltage source connected to said electrodes, and means connected to said electrodes for measuring the charge collected



during a predetermined time interval under the influence of the incident X-rays.

4,055,768

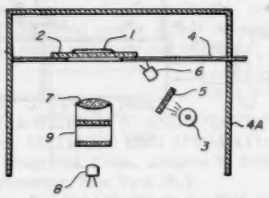
LIGHT MEASURING APPARATUS

Nathan S. Bromberg, 461 Conant Road, Weston, Mass. 02193

Filed Sept. 7, 1976, Ser. No. 721,065

Int. Cl.² G01N *21/38*

U.S. Cl. 250—461 R **6 Claims**



1. Apparatus of the type for measuring light emitted, scattered, or reflected from a specimen, the apparatus comprising

a. a source of excitation radiation arranged to illuminate the specimen,

b. modulating means for modulating the excitation radiation,

c. means for emitting a K signal when the specimen has been subjected to a selected amount of excitation radiation,

d. a photodetector arranged to provide an electrical signal in response to the intensity of the light emitted, scattered, or reflected by the specimen,

e. means for amplifying the output signal of the photodetector,

f. a phase sensitive detector having the amplified signal applied to its input,

g. means coupled to the modulating means and deriving signals therefrom which regulate the operation of the phase sensitive detector,

h. an integrator having its input coupled to the output of the phase sensitive detector, and

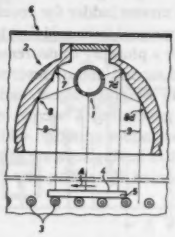
i. means responsive to the K signal for measuring the quantum of the signal accumulated in the integrator at the emission of the K signal.

4,055,769

METHOD AND APPARATUS FOR CURING, A COATING ON A SUBSTRATE

Conrad Sander, Panoramastrasse 55, D-7441 Zizishausen, Germany

Division of Ser. No. 343,179, March 20, 1973, abandoned. This application July 9, 1975, Ser. No. 594,366
Claims priority, application Germany, Mar. 21, 1972, 2213831
Int. Cl.[2] G01J 1/00
U.S. Cl. 250—492 R 4 Claims



1. An apparatus for curing a coating applied to a substrate, which coating comprises an exothermically reacting organic substance, comprising

a high pressure mercury-vapor tube for producing ultraviolet rays, said tube being located sufficiently distant from said substrate to prevent adverse heating of the substrate or of said organic substance and said tube being designed to produce sufficient radiation density to initiate the exothermic reaction of said organic substance; and

a reflector casing, having a smooth reflective surface, arranged longitudinally about said tube for reflecting said rays into at least one beam directed at said substrate and comprising two opposed concave members spaced from said tube, each such member having a surface defining substantially a quarter circle and an adjacent parabolic configuration on the side facing the tube for focusing such rays into said directed beams, said arrangement of the reflector casing being designed in such a manner that at least one beam of rays with a threshold value which is sufficient to initiate such reaction is produced.

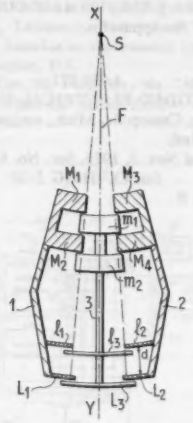
4,055,770

COLLIMATOR ARRANGEMENT FOR A BEAM OF ACCELERATED CHARGED PARTICLES

Jacques Milcamps, and Alain Penet, both of Paris, France, assignors to C.G.R.-Mev., France

Continuation of Ser. No. 339,857, March 9, 1973, abandoned. This application Aug. 26, 1974, Ser. No. 500,742
Claims priority, application France, Mar. 15, 1972, 72.08926
Int. Cl.[2] G21F 5/04
U.S. Cl. 250—505 4 Claims

1. A collimator arrangement, for an accelerated charged particle beam, comprising a first collimator system for partially intercepting said charged particle beam and a second collimator system associated with said first collimator system for intercepting the diffused particles of said beam and the secondary particles produced by said beam impinging upon said first collimator system, said collimator arrangement having an axi XY which is coincidental with the mean path of said beam; said first collimator system comprising four pairs of collimating elements each formed as a jaw, four movable supports, each of said movable supports respectively carrying a pair of said collimating elements thereof separated from each other along the axis XY, each said jaw facing another jaw, said movable supports being mechanically connected to one another and symmetrically disposed with respect to a plane containing said axis XY for movement of said facing jaws toward and away from each other, and said second collimator system comprising four support-rods each mechanically associated with one of said movable supports for movement therewith, each of said support-rods carrying at least an intermediate metal strip and a terminal metal strip fixed at the free end of said support-rod, the internal edge of each intermediate strip being set back in relation to the internal edge of the terminal strip carried by the same support-rod, said intermediate strips and terminal strips of each pair of support-rods being thinner in the XY axis direction than said jaws and respectively located opposite one another and symmetrically disposed with respect to a plane containing said axis XY.

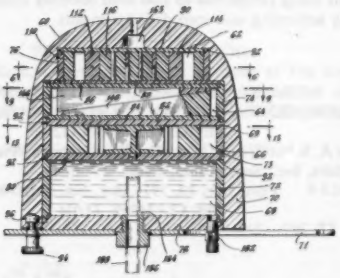


4,055,771

TEST BODY FOR A SCANNING TOMOGRAPHIC ANALYTICAL APPARATUS

David John Goodenough, Myersville; Kenneth E. Weaver, Gaithersburg, both of Md.; Joseph G. Smrcka, and William Clayman, both of Norwalk, Conn., assignors to Alderson Research Laboratories, Inc., Stamford, Conn.

Filed Oct. 26, 1976, Ser. No. 735,801
Int. Cl.[2] G02B 5/00
U.S. Cl. 250—505 27 Claims



1. A test body for determining an operating characteristic of a tomographic apparatus of a type which is adapted to scan a human body member with an X-ray beam along an edge of a slice through the member, accumulate data in electrical form during the scanning which is representitive of variations in the intensity of the transmission of X-ray energy through the member during a plurality of scans, and reconstruct a cross sectional image of the slice from the accumulated data comprising:

A. energy absorption means arranged in layered arrays, each array extending generally parallel to a direction of projec-

tion of the X-ray beam and comprising one or more energy absorption test elements adapted for absorbing electromagnetic energy from an impinging X-ray beam and having a predetermined energy absorption characteristic; and,

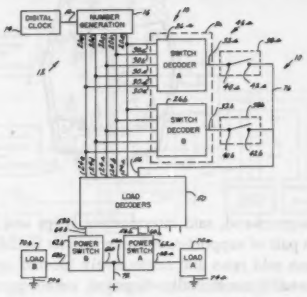
B. means for positioning said energy absorbing means between a scanning X-ray beam and a transmission intensity dectector of the apparatus.

4,055,772

DIGITALLY CODED ELECTRICAL SUPPLY SYSTEM

Tommy Y. Leung, Cassopolis, Mich., assignor to CTS Corporation, Elkhart, Ind.

Filed Nov. 3, 1975, Ser. No. 628,580
Int. Cl.[2] H02G *3/00*
U.S. Cl. 307—10 R **19 Claims**



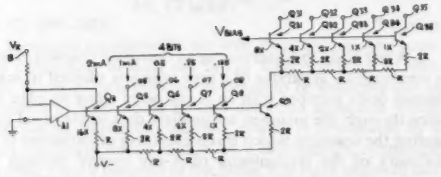
1. In a digitally coded electrical supply system, the combination comprising a code transmission cable having a plurality of code transmission conductors therein, code generator means being connected to said plurality of code transmission conductors for sequentially and cyclically producing digitally coded electrical pulses simultaneously in said code transmission conductors corresponding to respective ones of a plurality of numbers, load decoder means being connected to said code transmission conductors for decoding one of said numbers and for producing a digital output signal when both said load decoder means is activated and said one number is digitally encoded into said code transmission conductors and activating means being connected to said load decoder means for selectively activating said load decoder means.

4,055,773

MULTISTAGE ELECTRICAL LADDER FOR DECREMENTING A SIGNAL INTO A PLURALITY OF WEIGHTED SIGNALS

John A. Schoeff, Los Gatos, Calif., assignor to Precision Monolithics, Inc., Santa Clara, Calif.

Filed Dec. 22, 1975, Ser. No. 642,770
Int. Cl.[2] H03K *13/04*
U.S. Cl. 307—229 **13 Claims**



1. An improved electrical ladder for use in forming a plurality of weighted signals comprising,

a master ladder network having an input reference signal means, a first signal scaling means having a plurality of first scaled output devices having a first scaling range connected for receiving said reference signal and dividing it into a plurality of decrementally weighted signals, one of said first output devices associated with each decrementally weighted signal,

a first terminator means for generating a first remainder signal from said master ladder network, and

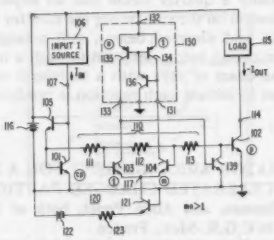
a first slave ladder network having a second signal scaling means having a plurality of second scaled output devices, having a second scaling range, at least some of which is within said first scaling range, said second output devices connected to said master ladder for receiving said generated first remainder signal from said first terminator means and dividing it into a plurality of decrementally weighted signals, one of said second output devices associated with each decrementally weighted signal, and a second terminator means for generating a second remainder signal from said first slave ladder network, said first and second scaled output devices having separate output terminals for providing decremented signal outputs.

4,055,774

CURRENT SCALING APPARATUS

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1976, Ser. No. 690,719
Claims priority, application United Kingdom, Sept. 26, 1975, 39619/75
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—296 R **27 Claims**



1. A current scaling apparatus comprising, in combination:

first and second and third and fourth transistors, each having base and emitter electrodes and a base-emitter junction therebetween and having a collector electrode, said first and said second transistors being of the same conductivity type as each other and having interconnected emitter electrodes, said third and said fourth transistors being of the same conductivity type as each other and having interconnected emitter electrodes;

means operating said third and said fourth transistors with different densities of current flow through their respective base-emitter junctions for defining a difference between their respective base potentials;

means for scaling up the difference between the base potentials of said third and said fourth transistors by a fixed ratio; and

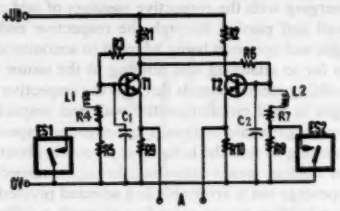
means applying the scaled up difference potential between the base electrodes of said first and said second transistors for determining the ratio between their respective collector currents.

4,055,775

TRANSMISSION CIRCUIT FOR DIRECT CURRENT DATA TRANSMISSION

Helmut Fiedler, Gartenberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 464,860, April 29, 1974, which is a continuation of Ser. No. 257,382, May 26, 1973, which is a continuation of Ser. No. 23,000, March 26, 1970, abandoned. This application May 14, 1975, Ser. No. 577,448
Claims priority, application Germany, Apr. 9, 1969, 1918090
Int. Cl.[2] H03K *17/60;* H04L *25/02*
U.S. Cl. 307—254 6 Claims



1. Apparatus for producing at different times positive and negative direct current signals responsive to binary signal levels from a data source, said current singals having substantially equal magnitudes and being produced from two output signal terminals, said apparatus having a substantially zero source impedance, comprising:

a source of operating voltage having a pair of output terminals,

first and second transistors, each having a conductive path established between the collector and emitter thereof and a base electrode, the application of voltages to which causes proportional amounts of current to flow through said conductive path, p1 first and second equal-valued emitter resistances connecting the emitters of said first and second transistors, respectively, to one of said output terminals of said operating voltage source,

first and second equal-valued collector resistances connecting the collectors of said first and second transistors, respectively, to the other of said output terminals of said operating voltage source,

first voltage divider means having input terminals connected, respectively, to the collector of said second transistor and to said one output terminal of said operating voltage source and having output terminals connected, respectively, to the base of said first transistor and to said one output terminal of said operating voltage source,

first switching means coupled to said voltage divider means for varying, responsive to the presence of a first of said binary signal levels, the voltage output at said output terminals of said first voltage divider means,

second voltage divider means having input teriminals connected, respectively, to the collector of said first transistor and to said one output terminal of said operating voltage source and having output terminals connected, respectively, to the base of said second transistor and to said one output terminal of said operating voltage source,

second switching means coupled to said second voltage divider means for varying, responsive to the presence of a second of said binary signal levels, the voltage output at said output terminals of said second voltage divider means,

said operting voltage source output, said first and second emitter resistances and the base currents of said first and second transistors being of values such that when said first and second switching means are unoperated, currents of substantially equal values flow through said conductive paths of said first and second transistors and

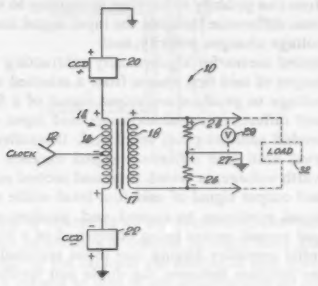
connection means connecting said emitters of said first and second transistors, respectively, to said output signal terminals of said apparatus as to produce therefrom direct current signals which are a function of the difference between the magnitudes of the currents flowing, respectively, through said first and second transistors.

4,055,776

CCD DIFFERENTIAL CURRENT APPARATUS

Robert W. Means, Lausanne, Switzerland, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 26, 1976, Ser. No. 735,652
Int. Cl.[2] H03K *5/20*
U.S. Cl. 307—355 3 Claims



1. A differential current apparatus for use with a source of clock signals, comprising:

at least a pair of differentially coupled plural charge coupled solid state devices;

a center-tapped primary inductor, connected at one end to one of the said pair of charge coupled devices and connected at the other end to the other of said pair of devices, the center tap of said primary inductor connectable to said source of clock signals; and

a secondary inductor inductively coupled to said center-tapped primary inductor for signal transfer therebetween;

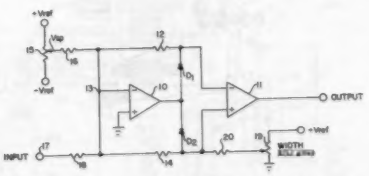
whereby when a clocking pulse is applied to the center tap of the primary of the inductor, comprising a differential current is caused by the coupled clock pulses flowing in said center-tapped primary.

4,055,777

WINDOW COMPARATOR

James M. Black, Quartz Hill, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 2, 1976, Ser. No. 737,974
Int. Cl.[2] H03K *5/153*
U.S. Cl. 307—360 6 Claims



1. A window comparator comprised of

a first means for algebraically subtracting an input signal from a selected set-point voltage to produce a difference output indicating when said input signal exceeds a set-point level established by said set-point voltage, said first means being comprised of an operational amplifier having

an inverting input terminal connected to a summing junction and two feedback circuits connecting the output of said operational amplifier to said summing junction, one feedback circuit comprising a first diode in series with a resistor, the first diode having its anode connected to the output of the first operational amplifier, and the other feedback circuit comprising a second diode in series with a resistor, the second diode having its cathode connected to the output of said first operational amplifier; a first summing resistor coupling said input signal to said summing junction and a second summing resistor coupling said set-point voltage to said summing junction, said set-point voltag being selected for the set-point level at which the linear output of the first operational amplifier crosses from one polarity to another according to when the algebraic difference between the input signal and the set-point voltage changes polarity, and

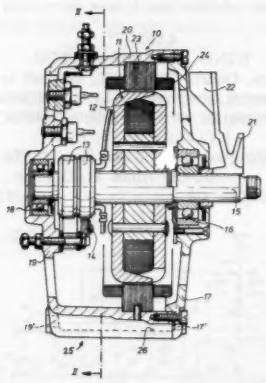
a second means for algebraically subtracting the difference output of said first means from a selected window-width voltage to produce an output signal of a first level until said difference signal indicates said input signal has exceeded said set-point level and, thereafter of a second level until said difference signal exceeds said window-width voltage, at which time said second means produces said output signal of said first level while said difference signal continues to exceed said window-width voltage, said second means being comprised of a high gain differential amplifier having one input terminal connected to the junction between the diode and feedback resistor in one of said feedback circuits and a second input terminal connected to the junction between the diode and feedback resistor in the other one of said feedback circuits, and means for connecting said window-width voltage to one of said two input terminals of said differential amplifier.

4,055,778

GENERATOR HOUSING

Georg Binder, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Continuation-in-part of Ser. No. 434,587, Jan. 8, 1974, which is a continuation of Ser. No. 273,189, July 19, 1972, abandoned.
This application Sept. 4, 1975, Ser. No. 610,404
Claims priority, application Germany, Aug. 5, 1971, 7129982[U]
Int. Cl.² H02K 5/00
U.S. Cl. 310—89 **10 Claims**



1. In a generator for a motor vehicle, a combination comprising a shaft having a longitudinal axis and being rotatable about the same; a pulley rigidly attached to said shaft for driving the same; a rotor affixed to said shaft so as to rotate with the same; a stator surrounding said rotor; and a housing including a substantially cylindrical circumferential wall surrounding said stator in substantial parallelism with said longitudinal axis and having axially spaced end portions, said circumferential wall being circumferentially bounded by a substantially cylindrical outer surface and a substantially cylindrical inner surface, which surfaces extend over the entire axial length of said circumferential wall, said circumferential wall further having a plurality of openended passages arranged parallel to said longitudinal axis and located entirely within said circumferential wall between said outer surface and said inner surface, said housing further including two axially spaced end walls extending substantially transversely to said longitudinal axis and connected to the respective end portions of said circumferential wall, said end walls having a plurality of openings aligned and merging with the respective passages of said circumferential wall and passing through the respective end walls, said passages and openings being adapted to accommodate holding means for so attaching said housing to the motor vehicle that said holding means extends through the respective ones of said passages in said circumferential wall and respective ones of said openings in said end walls and engages respective parts of said housing so that the housing is pivotable about at least one of said holding means extending through a respective passage and openings but is arrestable in a selected pivoted position by another holding means extending through a different passage and openings, whereby the forces to which said parts of said housing are subjected are reduced, and damage to said parts due to such forces is prevented as a result of the arrangement of said passages within said circumferential wall radially inwardly of said outer surface and radially outwardly of said inner surface, of the location of said openings in said end walls, and of the accommodation of the holding means in said passages and openings.

4,055,779

GAS DISCHARGE LAMP

Jürgen Schäfer, Niedermittlau, Germany, assignor to Original Hanau Quarzlampen GmbH, Hanau, Germany

Filed Aug. 1, 1975, Ser. No. 601,570
Claims priority, application Germany, Aug. 9, 1974, 2438372
Int. Cl.² E05C 7/06
U.S. Cl. 313—220 **3 Claims**

1. In a vapor discharge lamp the improvement comprising said generally straight tubular radiation body being divided within that portion between the ends of the electrodes into a central sector and end sectors disposed on each side thereof, said sectors being of generally equal length and of generally constant cross sectional area and wherein the cross sectional area of the end sectors is less than that of the center sector for effective uniform light radiation above a predetermined minimum threshold power over approximately 90% of the length of the tubular radiation body between electrodes.

4,055,780

THERMIONIC EMISSION CATHODE HAVING A TIP OF A SINGLE CRYSTAL OF LANTHANUM HEXABORIDE

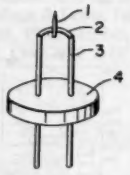
Shichio Kawai; Takaho Tanaka; Eisuke Bannai; Kenji Uchida, all of Sakura, and Ryuichi Shimizu, Minou, all of Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

Filed Apr. 12, 1976, Ser. No. 675,963

Claims priority, application Japan, Apr. 10, 1975, 50-43717; Apr. 24, 1975, 50-50135; Sept. 4, 1975, 50-107739

Int. Cl.[2] H01J *1/14, 19/06;* H01K *1/04*

U.S. Cl. 313—346 R 8 Claims



1. A thermionic emission cathode which comprises a tip which includes only a single crystal of lanthanum hexaboride.

4,055,781

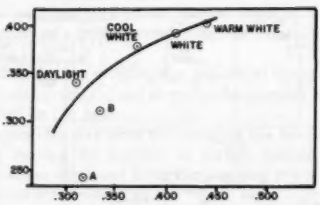
SPECIAL PURPOSE FLUORESCENT LAMP

Willy P. Schreurs, Danvers, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Sept. 9, 1974, Ser. No. 504,412

Int. Cl.[2] H01J *1/63*

U.S. Cl. 313—487 1 Claim



1. A fluorescent lamp comprising an envelope filled with an inert gas at low pressure, a filament within said envelope carrying an electron emitting coating of alkaline earth oxide and a coating of four blended phosphors disposed on the interior surface of said envelope, said coating comprising two broad band blue emitters, one broad band orange emitter and a single narrow band emitter peaking in the deep red region of the visible spectrum, said blue emitters being lead activated calcium tungstate and antimony activated calcium fluorophosphate and comprising between 40 to 60 weight percent of the total phosphor weight, said red emitting phosphor being manganese activated magnesium fluogermanate and comprisng between 10 and 30 weight percent of the total phosphor weight, said orange emitting phosphor being tin activated strontium magnesium orthophosphate, the chromaticity of said lamp being in the purple region of the C.I.E. chromaticity chart.

4,055,782

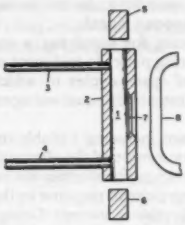
METHOD OF ENHANCING CYCLOTRON BEAM INTENSITY

Ed D. Hudson, Knoxville, Tenn., and Merrit L. Mallory, East Lansing, Mich., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 22, 1977, Ser. No. 789,765

Int. Cl.[2] H05H *7/08, 13/00*

U.S. Cl. 315—111.9 4 Claims



1. In a method of operating an isochronous cyclotron comprising the steps of feeding a desired primary feed gas at a selected feed rate to the internal ion source of said cyclotron for producing a plasma of ions in the arc chamber of said ion source; withdrawing and accelerating ions from said arc chamber with the rf system and magnetic field of said cyclotron; and extracting a desired separated ion beam from said accelerated ions in said cyclotron with the ion beam extraction system of said cyclotron, the improvement comprising the steps of feeding a small amount of an easily ionized arc support gas to said arc chamber simultaneously with said feeding of said primary feed gas to said arc chamber, and at the same time reducing the feed rate of said primary feed gas to said arc chamber to a desired lower value such as to maintain the arc voltage and arc current of said ion source at constant values, whereby the desired separated ion beam extracted from said cyclotron has its intensity substantially enhanced over that achievable without the use of said arc support gas.

4,055,783

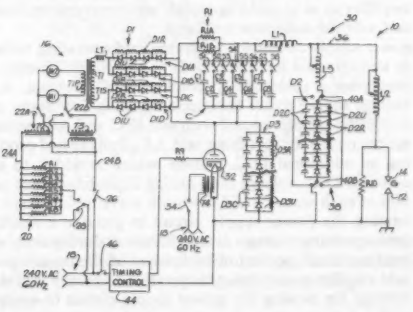
SPARK SOURCE WITH REGULATION OF SPARK MAGNITUDE BY CONTROL OF SPARK TIMING

John P. Walters, and David M. Coleman, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 1, 1976, Ser. No. 662,891

Int. Cl.[2] G01J *3/30;* H05B *7/20*

U.S. Cl. 315—241 R 22 Claims



1. A spark source, comprising

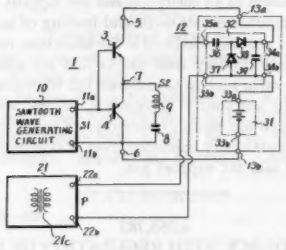
a high voltage transformer having a secondary winding for supplying alternating current at a high voltage,
a storage capacitor,
a charging circuit including a rectifier connected between said secondary winding and said capacitor for charging said capacitor,
spark gap electrodes having a spark gap therebetween,
a discharge circuit including an electronic switching device connected between said capacitor and said spark gap electrodes for discharging said capacitor across said spark gap,
said electronic switching device having input means for receiving triggering signals,
and control means for supplying a sequence of variably spaced triggering pulses to said input means for producing a sequence of spark cycles in which said capacitor is charged to substantially equal voltages for all of said spark cycles,
said control means including variable timing means responsive to the phase angle of the alternating current supplied to said high voltage transformer for varying the timing of each triggering pulse in response to the phase angle variation of the alternating current during the interval subsequent to the preceding triggering pulse.

4,055,784

ELECTRON BEAM DEFLECTION CIRCUIT

Shigeo Tanaka, Ichikawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 21, 1976, Ser. No. 678,737
Claims priority, application Japan, Apr. 24, 1975, 50-50394
Int. Cl.[2] H01J *29/70, 29/76*
U.S. Cl. 315—397 **9 Claims**



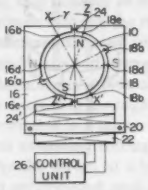
1. A vertical deflction circuit comprising:
an output circuit including first and second transistors connected to form a single-ended push-pull amplifiers having an output, an operating voltage terminal connected to said first transistor and adopted to receive an operating voltage for said transistors, a vertical deflection coil connected to said output of the single-ended push-pull amplifier, and means for applying sawtooth wave input signals to said amplifier so as to cause sawtooth wave currents to flow in said vertical deflection coil; and
a power supply circuit for supplying said operating voltage to said terminal including D.C. voltage source means for supplying a substantially constant D.C. voltage, A.C. voltage source means for supplying an A.C. voltage, and rectifier means connected with said D.C. and A.C. voltage source means for rectifying said A.C. voltage and producing an additional D.C. voltage which is added to said constant D.C. voltage only during a predetermined portion of each wave of said sawtooth wave input signals for causing the power supply circuit to provide a resulting first operating voltage at said terminal during only said predetermined portion of each wave of the input signals, said rectifier means being inoperative to rectify said A.C. voltage for causing the power supply circuit to apply to said terminal a second operating voltage corresponding substantially to said constant D.C. voltage during the remaining portion of each wave of said sawtooth wave input signals.

4,055,785

STEPPING MOTOR FOR ELECTRONIC TIMEPIECE

Fumio Nakajima, No. 5-3, 2-chome, Mejiro, Toshima, Tokyo; Takayasu Machida, No. 1562, Noda, Iruma, Saitama, and Kenji Yamada, No. 9-19, 1-chome, Nakamachi, Koganei, Tokyo, all of Japan

Filed June 18, 1976, Ser. No. 697,364
Claims priority, application Japan, Jan. 12, 1976, 51-2613; Feb. 26, 1976, 51-20495
Int. Cl.[2] H02K *29/00*
U.S. Cl. 318—138 **17 Claims**



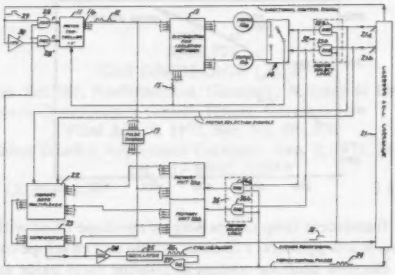
1. A stepping motor comprising a permanent magnet rotor, a stator including a driving coil and stator pole pieces electromagnetically connected thereto, said stator having at least one static equilibrium point at which said rotor is stable, and a control unit electrically connected to said driving coil, said control unit including means for energizing said driving coil to electromagnetically shift the static equilibrium position to a predetermined position.

4,055,786

CONTROL SYSTEM FOR TIME SHARING MULTIPLE STEPPER MOTORS WITH A SINGLE CONTROLLER

Alfred W. DiMarzio, Pattersonville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 6, 1976, Ser. No. 683,696
Int. Cl.[2] G05B *11/32*
U.S. Cl. 318—562 **12 Claims**



1. A motor control system for multiple stepper motors comprising
a plurality of stepper motors each having a rotor movable by discrete steps upon being supplied with sets of drive pulses determining stator winding combinations to be energized sequentially,
a single motor controller for generating said sets of drive pulses in repeating predetermined forward and reverse sequences representing the sequence of winding states for moving a desired motor to a commanded position,
a memory unit for each motor for storing drive pulse data representative of said sets of drive pulses and corresponding to the actual motor winding state,

means for selecting one motor and cycling said controller until the actual motor winding state stored in said memory unit and the controller winding state compare, and

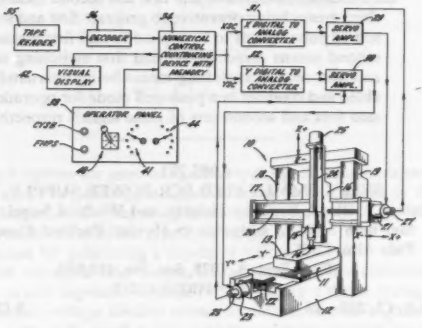
means for switching the selected motor for energization and successively triggering said controller to move the selected motor to the commanded position while enabling the respective memory unit for entry of drive pulse data.

4,055,787

INTERRUPTABLE NUMERICAL CONTOURING CONTROL SYSTEM WITH RETURN TO PATH SAFEGUARDS

Bruce R. Beadle, and Eugene A. Olig, both of Fond Du Lac, Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed July 28, 1975, Ser. No. 599,591
Int. Cl.[2] G05B *7/00*
U.S. Cl. 318—591 **24 Claims**



1. In a numerical contouring control system for moving a member simultaneously along plural axes to execute a programmed path, said system including

a. control means responsive to a block of command signals for moving the member along a corresponding path segment defined by such signals, and

b. means for supplying successive ones of a program of blocks of command signals to said control means (a) to cause said member to be moved seriatim through the segments of a programmed path, the improvement comprising

1. means for interrupting the sequential operation of said means (a) and (b) and stopping the member at a random point on the path,

2. means effective after the member has been so stopped for moving the member to various desired successive locations displaced from the stopping point,

3. means for creating signals which directly or indirectly represent the axis component displacements between (i) said stopping point and (ii) the actual location of said member after each movement created by said means (**2**),

4. means for producing a restart signal,

5. means responsive to said restart signal for restoring said means (a) and (b) to normal sequential operation, and

6. means controlled by said means (**3**) for disabling said means (**5**) unless and until said member is positioned at said path stopping point.

4,055,788

MOTOR CONTROL CIRCUIT

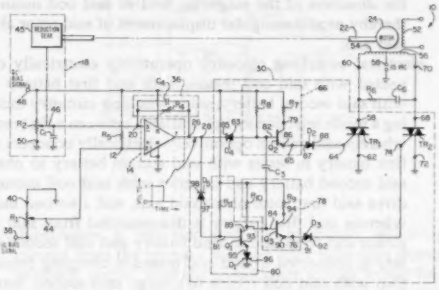
William Hancock Greeley, Jr., Marblehead, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Nov. 17, 1975, Ser. No. 632,870
Int. Cl.[2] G05B *5/01*
U.S. Cl. 318—624 **11 Claims**

1. A motor control circuit for controlling operation of a reversible motor having a shaft and motor control windings comprising:

position transducer means coupled to said motor shaft for providing an output electrical signal proportional to a displacement of said motor shaft from a reference motor shaft position;

comparator means having first and second input terminals and an output terminal, said comparator means being arranged to compare magnitude of a reference signal coupled to said comparator first input terminal with magnitude of said position transducer output electrical signal coupled to said comparator second input terminal to provide a motor direction control signal;



feedback means coupled between said comparator second input terminal and said comparator output terminal to cause said comparator means to oscillate to stop said motor operation when a difference in magnitude between said reference and transducer electrical signals is substantially equal to a predetermined magnitude; and

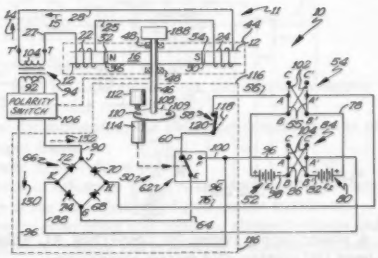
motor direction control means coupled between said comparator output terminal and said motor control windings, said motor direction control means being arranged to generate motor control signals for controlling said motor operation in response to said comparator means output signal.

4,055,789

BATTERY-OPERATED MOTOR WITH BACK EMF CHARGING

Henry C. Lasater, Cuba, N. Mex., assignor to Donald J. Dimmer, Cuba, N. Mex., a part interest

Filed Dec. 31, 1975, Ser. No. 645,876
Int. Cl.[2] H02J *7/00;* **H02P** *7/20*
U.S. Cl. 320—6 **9 Claims**



1. In combination with first and second batteries, an energy conserving electrical apparatus for driving a load and recovering otherwise wasted electrical energy, comprising:

a frame;

a first rotor movably mounted to said frame for angular displacement along a path and about an axis, said rotor

including a pair of poles and means for producing a magnetic field about said poles;

a first stationary pole member supported by said frame and adjacent said path of said rotor, said member having a pair of poles closely confronting the path of said rotor, said pole member including stationary means for producing a magnetic field about said pole member to interact with said magnetic field of said rotor;

at least one of said means for producing a magnetic field including coil means utilizing electromagnetic induction for establishing a magnetic field;

polarity reversing means electrically connected with said coil means to alternately reverse the electrical polarity of current applied to said coil means to alternately reverse the direction of the magnetic field of said coil means to thereby produce angular displacement of said rotor about said axis;

electrical switching circuitry operatively electrically connected with said coil means, with said first battery and with said second battery, said switching circuitry including a mode selection switch shiftable between a first mode, wherein said switch operatively electrically connects said first battery in series with said second battery to charge said second battery and in series with said coil means to drive said first rotor about said axis, and a second mode, wherein said first battery is disconnected from said coil means and from said second battery and said second battery is connected to said coil means in charging relationship with said coil means to charge said second battery with electrical energy induced in said coil means by said magnetic fields; and

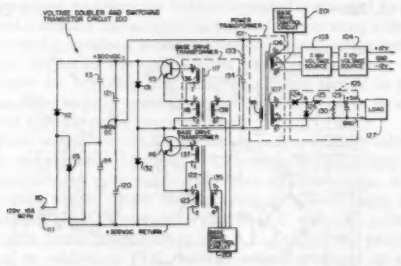
said mode selection switch shifting between said first and second modes in response to angular displacement of said rotor about said axis to energize said coil means from said first battery to thereby drive said rotor about said axis when in said first mode and when in said second mode to conduct current from said coil means to said second battery so that current induced in said coil means by said magnetic fields charges said second battery.

4,055,790

POWER SUPPLY WITH BASE DRIVE CONTROL

James H. Gerding, Framingham, and Albert M. Heyman, Bedford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 29, 1976, Ser. No. 755,391
Int. Cl.² H02M 7/00
U.S. Cl. 363—24 **13 Claims**



1. A power supply system for converting AC voltage to a low-level DC voltage, said system comprising:

means for converting the AC voltage to a first DC voltage level,

means for transforming the first DC voltage level to the low-level DC voltage, said transforming means including a primary winding having a pair of terminals and at least one secondary winding; and

means for applying the first DC voltage level to said means for transforming the first DC voltage level to the low-level DC voltage, said means for applying comprising:

first and second transistor switching means, each of said switching means including first and second terminals, said first terminal of said first switching means being connected to said second terminal of said second switching means in common with said first terminal of said primary winding, and said second terminal of first switching means being connected to said second terminal of said primary winding and to said first terminal of said second switching means; and

control means for controlling the switching action of said first and second switching means,

said control means including:

first means inductively coupled to said first and second terminals of said first transistor switching means;

second means inductively coupled to said first and second terminals of said second transistor switching means;

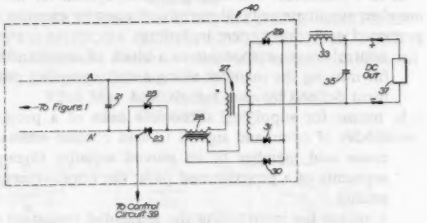
third means connected to said first and second means, said third means being operative to generate first and second sets of pulse signals to be applied to said first means and second means respectively, said first switching means and said second switching means being alternately enabled and disabled in a push-pull mode for operation by said first and second sets of pulse signals respectively.

4,055,791

SELF COMMUTATED SCR POWER SUPPLY

Robert J. Bland, Berkeley Heights, and Winfried Seipel, Califon, both of N.J., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sept. 8, 1975, Ser. No. 610,963
Int. Cl.² H02M 3/315
U.S. Cl. 363—28 **5 Claims**



1. An apparatus for producing a regulated D.C. power signal comprising:

a pair of input terminals for receiving an input signal; and

power mesh means coupled to the input terminals for producing a selected D.C. power signal, wherein said power mesh means includes:

input and energy storage means coupled to the input terminals for storing energy from the input terminals;

transformer means coupled to the input and energy storage means and having input and output windings;

switching means coupled to the input windings of said transformer means to selectively transfer a portion of the energy stored by the input and energy storage means to the transformer means; and

output rectifying means coupled to the output windings of the transformer means for rectifying the output signal from said transformer means;

a saturable transformer having a primary winding connected between the input winding of said transformer means and said switching means, and having a secondary winding with one end connected to a tap on the output winding of said transformer means; and

a diode having an anode connected to the other end of the secondary winding of the saturable transformer, and a

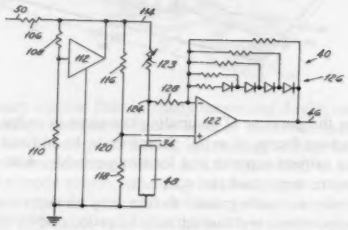
cathode connected to the common coupling point of said output rectifying means.

4,055,792

ELECTRICAL CONTROL SYSTEM FOR AN EXHAUST GAS SENSOR

Lawrence R. Foote, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 484,896, July 1, 1974, Pat. No. 3,946,198. This application Jan. 12, 1976, Ser. No. 648,340
Int. Cl.[2] G01R 17/02; F02M 7/00
U.S. Cl. 323—19 1 Claim



1. A system for generating an output signal from an exhaust gas sensor which output signal is linear for variations in the air/fuel mixture comprising in combination:

a variable resistance type exhaust gas sensor;

means for generating a regulated voltage;

first voltage divider means, including said sensor, connected to said regulated voltage for generating a signal voltage;

second voltage divider means connected to said regulated voltage in parallel with said first voltage divider means, for generating a reference voltage;

amplifier means having an output terminal and at least two input terminals, said input terminals arranged to receive said signal and reference voltages, respectively; and

circuit means interconnecting said output terminal and one of said input terminals, operative to controllably vary the energization of said sensor whereby the output signal of said amplifier may be rendered linear with respect to changes in the air/fuel ratio of the combustion mixture forming the exhaust gas environment of the sensor; said circuit means comprising:

a plurality of diode members connected electrically in series with each other with a first cathode connected to the amplifier means output terminal and a series resistor interconnecting one of the amplifier input terminals to the series connected diode members;

a resistor interconnecting said one amplifier input terminal to the amplifier output terminal in parallel with said series connected resistor and plurality of diode members; and

a plurality of resistors, less in number by one than the number of diode members and connected between said one amplifier input terminal and the anode/cathode junctions between selected pairs of the series connected diode members on a one-to-one basis.

4,055,793

ELECTRICAL LOAD CONTROLLER

Peter G. Bartlett, Davenport, Iowa, assignor to Automation Systems, Inc., Eldridge, Iowa

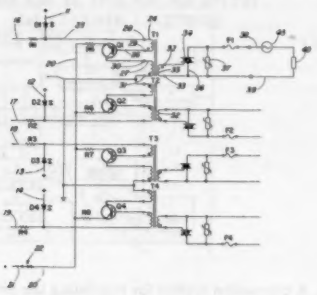
Filed July 8, 1976, Ser. No. 703,398
Int. Cl.[2] G05F 3/04
U.S. Cl. 323—22 SC 8 Claims

1. An electrical load control comprising:

a triac having a first and second anode and operable to have an electrical load in series with a source of electrical energy coupled across its anodes and having a gate which presents a low impedance to said first anode with a first polarity signal and which presents a high impedance to said first anode with an opposite polarity signal;

a saturable transformer having a secondary winding, a first end of which is coupled to the triac gate and a second end of which is coupled to said first anode of the triac, and having a primary winding; and

electronic switch means for coupling, in a first condition, electrical current through the primary winding until the



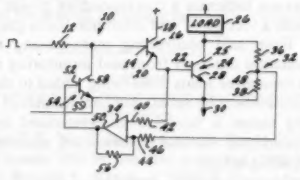
transformer is saturated and for essentially removing current from the primary winding after saturation during a flyback period, until the transformer returns to said first condition, said switch means directing current such that said gate presents a high impedance to said first anode during conduction by the primary winding and said gate presents a low impedance to said first anode when the primary winding is essentially non-conducting during said flyback period.

4,055,794

BASE DRIVE REGULATOR

Charles M. Ickes, Chula Vista, and Eugene T. Perusse, San Diego, both of Calif., assignors to Rohr Industries, Incorporated, Chula Vista, Calif.

Filed May 10, 1976, Ser. No. 684,752
Int. Cl.[2] G05F 1/56
U.S. Cl. 323—22 T 11 Claims



1. A base drive regulator for the output transistor of a switching amplifier comprising:

means for monitoring the collector element voltage of said output transistor;

a source of base drive voltage;

a source of reference voltage, said source of reference voltage is the base element of said output transistor;

means for comparing said collector element voltage and said reference voltage and producing a separate instantaneous output voltage level corresponding to any difference therebetween; and

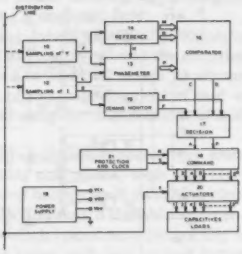
means for varying the level of said base drive voltage in response to said separate instantaneous, output voltage level for maintaining the conduction of said output transistor just at the edge of saturation wherein said base drive and collector element voltage levels are substantially equal during varying load conditions thereon.

4,055,795

CORRECTION SYSTEM FOR REGULATING THE POWER FACTOR OF AN ELECTRICAL NETWORK

Serge Mathieu, Ste-Foy, Canada, assignor to h.o.p. CONSULAB Inc., Canada

Filed July 15, 1976, Ser. No. 705,462
Int. Cl.[2] H02J 3/18
U.S. Cl. 323—102 **4 Claims**



1. A correction system for regulating the power factor of an electrical distribution network, comprising:

means for sampling the potential difference of a distribution line of said network;

means for sampling the current of said distribution line;

means generating and storing first and second predetermined reference limits relating to desired power factors;

means for measuring the phase difference based on the sampled potential difference and the sampled current;

means for comparing the measured phase difference to said predetermined reference limits;

means for monitoring the actual demand of said electrical distribution network; and

means for controlling load actuating means connected to said distribution network in response to information obtained from said comparing means and information obtained from said monitoring means; said load actuation means being connected to capacitive loads whereby one or more capacitive loads may be added to the distribution network when the measured phase difference indicates a corresponding power factor which is below a first of said predetermined reference limits, and may be disconnected from the distribution network when the measured phase difference indicates a corresponding power factor which exceeds a second of said reference limits greater than said first limit; said controlling means being responsive to information obtained from said monitoring means to prevent capacitive loads from being added to the distribution network when the actual demand monitored by said monitoring means is below a predetermined demand value, independently of said information received from said comparing means.

4,055,796

CABLE SUPPORT AND LOCATOR STRUCTURE

Richard Allen Nelson, 23 Stonegate Road, LaGrange Park, Ill. 60525

Continuation-in-part of Ser. No. 658,457, Feb. 17, 1976, abandoned. This application Nov. 8, 1976, Ser. No. 739,619
Int. Cl.[2] G01V 3/08; G01R 31/08
U.S. Cl. 324—3 **8 Claims**

1. A combined support and locator for underground fixtures for use in conjunction with a metal detector of the type creating an electrical field, comprising in combination,

a support base for supporting an underground fixture thereon,

said support base formed of a moldable material,

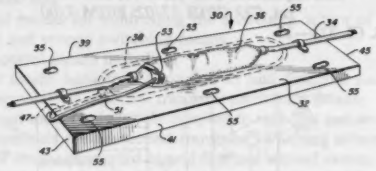
metallic means embedded within said support base,

said metallic means having sufficient mass and density such as to respond to the field created by the metal detector,

said base and metallic means being formed as an integral unit,

said metallic means further including a lateral extension portion extending laterally outwardly from said metallic means being similarly embedded within said support base and projecting outwardly from the confines of said support base for a distance,

said lateral extension portion being adapted for interconnection with the cable fixture supported on the support base



for the purpose of grounding the same in order to permit various forms of metal detectors to be utilized to locate the subject support and locator assembly, with the cable fixture supported thereon,

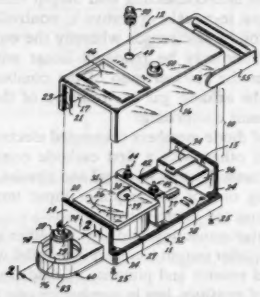
whereby an underground fixture may be supported on said support base and buried, may be re-located by the use of a metal detector of the type creating an electrical field which upon contsct with the embedded metallic means will generate a signal to indicate the presence of the support and locator and fixture located thereupon.

4,055,797

ELECTROLYTIC CONDUCTANCE METER

Henry Doeleman, Glendora, Calif., assignor to Devon Products, Inc., Los Angeles, Calif.

Filed May 4, 1976, Ser. No. 683,182
Int. Cl.[2] G01N 27/42
U.S. Cl. 324—30 R **6 Claims**



1. In a portable meter for measuring the conductance of an electrolytic solution, the combination comprising:

a casing;

a meter movement in said casing including a pointer movable relative to a scale viewed through a window on the upper surface of said casing;

an electrical circuit in said casing for controlling the movement of said pointer; and

a mount having a hub rotatably mounted on the end of said casing, said mount including a recessed threaded circular opening on the face thereof with a probe arising from the center thereof having a pair of spaced electrodes connected to the electrical circuit, and said mount being rotatable on its hub such that the probe on the face thereof is in an upright position or a downward position relative to the scale as viewed from the upper surface of said casing.

4,055,798

ROTARY ELECTRIC FIELD INTENSITY MEASURING DEVICE

Giichiro Kato, 36-12 Yoyogi 1-chome, Shibuya, Tokyo, Japan

Filed Feb. 27, 1976, Ser. No. 662,281
Claims priority, application Japan, Aug. 25, 1975, 50-102758
Int. Cl.[2] G01R 5/28, 31/02
U.S. Cl. 324—32 8 Claims

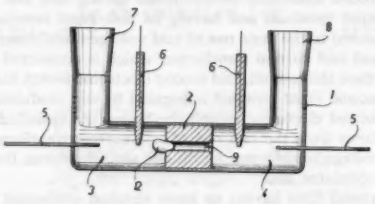
1. A rotary electric field intensity measuring device comprising a housing, stationary frusto-conical electrode means secured to said housing and having alternating voltage inducing means, an induced charge take-out line connected to said stationary electrode means, shielding frusto-conical rotary electrode means spaced above said stationary electrode means and having alternating voltage inducing means in cooperation with said stationary electrode means, and means to rotate said rotary electrode means.

4,055,799

METHOD OF AND DEVICE FOR MEASURING ELASTIC AND DI-ELECTRIC PROPERTIES OF THE DIAPHRAGM OF LIVING CELLS

Hans Coster, New South Wales, Australia; Günter Pilwat, and Ulrich Zimmermann, both of Julich, Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Jan. 22, 1976, Ser. No. 651,337
Claims priority, application Germany, Jan. 23, 1975, 2502621
Int. Cl.[2] G01N 27/00
U.S. Cl. 324—71 R 5 Claims



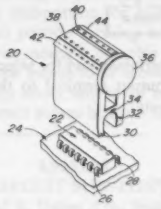
1. A method of ascertaining elastic and di-electric properties of the diaphragm of individual living cells of living beings and of the diaphragms of living cells of living beings which living cells are in suspension in a physiological liquid or in an association as a layer of living cells of living beings, which includes the steps of: introducing any member of the group consisting of an individual cell, a plurality of individual cells, a number of individual cells, a layer of cells, and a plurality of layers of cells, into a physiological liquid which has a temperature within the range of from 0° to 40° C and which is electrically conductive and forms an electrolyte solution, locating said member between two electrodes in such a manner that the flow lines of an electric field provided between said two electrodes penetrates the diaphragm of said member introduced into said physiological liquid forming said electrolyte solution, applying to said electrodes a sequence of voltage pulses with a constant pulse duration of from 1 μs to 10 ms, increasing the amplitude of said voltage pulses between 100 mV and 5 V until at the obtainment of the break-down voltage the resulting measurable current pulses greatly increase, and measuring the break-down voltage on two measuring electrodes arranged current-less on both sides of said member provided between said electrodes.

4,055,800

TEST CLIP FOR ELECTRONIC CHIPS

Charles S. Fisk, Boston, and Dietrich Jung, Belmont, both of Mass., assignors to Dietrich Jung, Newton, Mass.

Filed Apr. 16, 1976, Ser. No. 677,757
Int. Cl.[2] G01R 31/02, 1/06
U.S. Cl. 324—72.5 7 Claims



1. A clip for attachment to electronic chips in order to permit testing thereof, said clip comprising:

a. an integral polymeric body including a pair of clamp elements and a hinge element, said clamp elements being relatively thick for rigidity and said hinge elements being at least partially relatively thin for flexibility along an axis;

b. said clamp elements being pivotable with respect to each other about said axis and having lever portions extending generally away from said axis in one direction and jaw portions extending generally away from said axis in the opposite direction;

c. at least one of said lever portions carrying means for biasing said lever portions away from each other into operative condition and for permitting said lever portions to move toward each other into inoperative condition;

d. said jaw portions having a plurality of open ended slots for seating upon the terminals of said electronic chip;

e. said lever portions having a series of openings extending from the outer extremities of said lever portions to the outer extremities of said jaw portions into communication with said slots; and

f. said means for biasing including manually operable control means.

4,055,801

AUTOMATIC ELECTRONIC TEST EQUIPMENT AND METHOD

Harold L. Pike, R.R. No. 2, Box 134, Castle Rock, Colo. 80104; G. Lamar Thomas, 368 W. Powers Ave., Apt. 201, Littleton, Colo. 80120; Ronald L. Ketchum, 3555 S. Pennsylvania, and John F. Evans, 4135 S. Hazel Court, both of Englewood, Colo. 80110

Filed Aug. 18, 1970, Ser. No. 64,703
Int. Cl.[2] G01R 15/12
U.S. Cl. 324—73 R 12 Claims

1. Apparatus for testing electronic equipment comprising:

a general purpose digital computer;

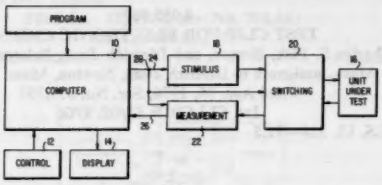
a stimulus unit including: a plurality of digital to analog and a plurality of digital to synchro converters, each of said converters being electrically connected to said computer by a common output bus;

a multiple lead test terminal adapted to be electrically connected to the electronic equipment to be tested;

a measurement unit including an analog to digital converter and a synchro to digital converter, said measurement unit converters being electrically connected to said computer by a common input bus;

a display unit electrically connected to said computer; and

switching means responsive to said computer for selectively connecting the converters of said stimulus unit to the leads



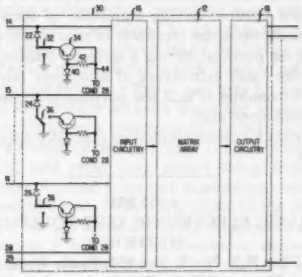
of said output terminal, and for selectively connecting the leads of said output terminal to the converters of said measurement unit.

4,055,802

ELECTRICAL IDENTIFICATION OF MULTIPLY CONFIGURABLE CIRCUIT ARRAY

Peter Theodore Panousis, Allentown; Robert Leonard Pritchett, Bath, and Friedolf Michael Smits, Allentown, all of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 12, 1976, Ser. No. 713,910
Int. Cl.[2] G01R *15/12, 31/30*
U.S. Cl. 324—73 AT **8 Claims**



1. A method adapted to be utilized in the fabrication of a multicode batch of almost visually indistinguishable but electrically different programmable integrated-circuit chips to make it unnecessary initially to physically mark the chips or to maintain records of the identity of each chip code, said method comprising the steps of

applying electrical interrogation signals to each physically unmarked but already programmed chip to determine the code thereof,

applying electrical test signals to each physically unmarked but already programmed chip in accordance with a unique testing program that respectively corresponds to the identification code of the chip,

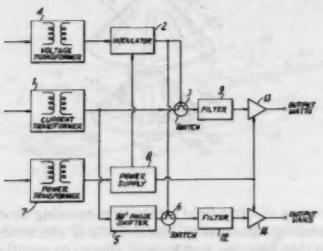
and comparing the output signals obtained from each physically unmarked but already programmed chip in response to said test signals with a standard set of output signals to determine the error condition of the chip.

4,055,803

COMBINED WATT AND VAR TRANSDUCER

Raymond L. Kraley, 39 Mountain Rise, Fairport, N.Y. 14450; Barry M. Pressman, 129 Clearview Drive, Penfield, N.Y. 14625, and Maghar S. Chana, 732 Sugar Creek Trail, Webster, N.Y. 14580

Filed Sept. 27, 1976, Ser. No. 726,848
Int. Cl.[2] G01R *21/06*
U.S. Cl. 324—142 **10 Claims**



1. A watt and var transducer for the simultaneous indication of watts and vars comprising, within the same enclosure,

a single voltage transformer means for the measurement of voltage and a single current transformer for the measurement of current;

a phase shift circuit connected to one of said voltage transformer means and said current transformer;

a single modulator having an input terminal connected to the other one of the said voltage transformer means and the said current transformer;

a first electronic switch means having input terminals connected to said phase shift circuit and said modulator, said first electronic switch means combining the waveforms from said phase shift circuit and said modulator;

a first filter having an input terminal connected to said first electronic switch and an output terminal at which the direct current voltage is proportional to vars on said power line;

a second electronic switch means having first and second input terminals and having its first input terminal connected to the same one of said voltage transformer means and said current transformer which is connected to said phase shift circuit, said second electronic switch having its second input terminal connected to said modulator, said second electronic switch combining the unshifted waveforms from the said one of said current transformer and voltage transformer means and the waveforms from said modulator; and

a second filter having an input terminal connected to said second electronic switch and an output at which the direct current voltage is proportional to watts on the said power line.

4,055,804

WATT/WATTHOUR TRANSDUCER AND AMPLIFIER-FILTER THEREFOR

Glenn A. Mayfield, 3060 Wilce Ave., Columbus, Ohio 43202

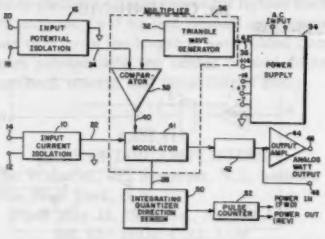
Continuation of Ser. No. 532,517, Dec. 13, 1974, abandoned. This application May 14, 1976, Ser. No. 686,457
Int. Cl.[2] G01R *21/06, 11/32*
U.S. Cl. 324—142 **6 Claims**

5. A power transducer for providing an output current through an output load which is proportional to the power through a power line, said transducer comprising:

a. input scaling means connected to a power line and including a current input means and a voltage input means for providing electrical signals proportional to the instantaneous voltage and current of said power line, at least one

of said input means being a high impedance current source;

b. a multiplier means connected to said input scaling means and having no substantial current path shunting the modulated current, for pulse width modulating the current from said high impedance current source with the signal from the other of said input means to provide output current pulses having an amplitude substantially equal to the amplitude of the instantaneous signal from said high impedance current source and having a pulse width proportional to the amplitude of the other of said signals;



c. a dc current amplifier having no substantial current path shunting the modulated current and having its input coupled to the output of said multiplier means; and

d. a current conducting path serially including said output load and connected across the output of said dc current amplifier and having no substantial intermediate current shunting path;

whereby a substantially non-shunted current loop is provided serially through said high impedance current source and said output load and wherein the current along said path is proportional to the electrical power flow through said power line.

4,055,805

MULTI-POINT TEST PROBE

Frank J. Ardezzone, Santa Clara, Calif., assignor to Probe Rite, Inc., Santa Clara, Calif.

Filed June 28, 1976, Ser. No. 700,489
Int. Cl.[2] G01R *31/02, 1/06*
U.S. Cl. 324—158 P **12 Claims**

1. A probe head assembly for use in testing miniature electronic devices, and comprising:

an electrically insulating board having a planar first surface, a planar second surface and an aperture formed in a generally central portion thereof;

a first plurality of electrically conductive contact strips disposed upon at least one of said surfaces and arrayed along an edge of said board to form a board interconnect means;

a plurality of probe means each including an elongated body disposed upon said first surface and oriented along a radial line extending outwardly from the center of said aperture, said probe means being affixed to said board by pivot means which permit said probe means to be rotated thereabout in the plane of said first surface and to be moved along said radial lines, each of said probe means further including a contact means affixed to the end of said body nearest said aperture;

a plurality of electrical conductors respectively coupling said probe means to different ones of said first contact strips;

support means having a form concentric with said aperature attached to said board, said support means having a raised portion having a hollow inverted generally V-shaped cross-section, a circular guide supported by the support means attached in concentric relation to said aperature, said circular guide having means forming a fulcrum above each probe means; and

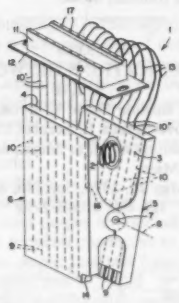
elongated lever means including a first end portion for insertion within said raised portion and having means for drivably engaging one of said probe means, said lever means further having a mid-portion for engaging said fulcrum and a second end portion forming an elongated handle, whereby said lever means is movable about said fulcrum to cause said probe means to be moved along said radial lines and pivotally about said pivot means to selectively position said contact means beneath said aperture.

4,055,806

INTEGRATED CIRCUIT SUBSTITUTION DEVICE

Harshad M. Patel, 743 E. Duane Ave., Sunnyvale, Calif. 94086

Filed Jan. 23, 1976, Ser. No. 651,732
Int. Cl.[2] G01R *31/22, 31/02*
U.S. Cl. 324—158 F **4 Claims**



1. An integrated circuit substitution device comprising a princer-like clip on probe having a plurality of engaging contacts arranged in two rows, means to bias said two rows of contacts towards each other normal to the opposed surface intermediate a pair of probe plates, each of said rows to contacts exposed upon a contact edge of said opposed surfaces, the contacts in one of said rows of contacts rigidly electrically connected with rigid connectors to a first row of terminals of an integrated circuit test socket, the contacts in the other row of said contacts flexibly electrically connected with flexible conductors to a second row of terminals of said integrated circuit test socket, the sum of all of said terminals of said integrated circuit test socket exceeding the sum of all of said contacts in both of said rows of contacts, a notch, said notch being located in said contact edge of said opposed surfaces adjacent to one of said contacts whose width is greater than the width of any of said contacts and less than the distance intermediate adjacent edges of a pair of said contacts.

4,055,807

ANTENNA SWITCH

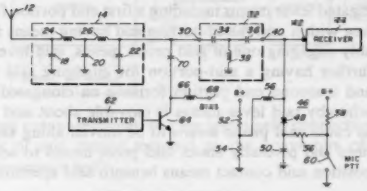
David Joseph Priniski, Hoffman Estates, and Jerry David Meyerhoff, Buffalo Grove, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1976, Ser. No. 670,199
Int. Cl.[2] H04B *1/48*
U.S. Cl. 325—21 **16 Claims**

1. An antenna switch, operable in a transmit or receive

mode, for switching an antenna to either a transmitter or a receiver, respectively, the transmitter and receiver being operable in a frequency band, the antenna switch comprising:

a filter means, having an input and an output, the filter input being coupled to the antenna and the filter output being coupled to the receiver, the filter passing signals from the antenna to the receiver with the antenna switch in the receive mode, the filter forming an anti-resonant circuit to



said frequency band, at its input, when its output is near ground potential, said filter means exhibiting a high pass characteristic for passing signals in said frequency band and at high frequencies when the antenna switch is in the receive mode;

means for coupling the transmitter to the filter input; and

means for grounding the filter output when the antenna switch is in the transmit mode.

4,055,808

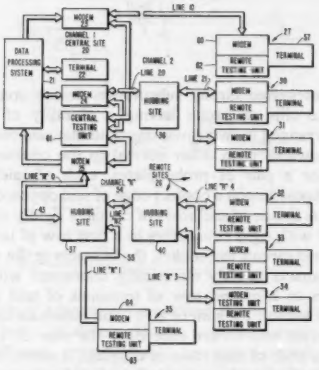
DATA COMMUNICATIONS NETWORK TESTING SYSTEM

Jerry L. Holsinger, Boston; David L. Lyon, Cambridge; David E. Williams, Andover; Frank B. Lezotte, Chelmsford, and Don I. Falkenstein, Burlington, all of Mass., assignors to Intertel, Inc., Burlington, Mass.

Filed May 20, 1976, Ser. No. 688,330

Int. Cl.[2] H04B *1/72*

U.S. Cl. 325—67 **52 Claims**



40. Apparatus for testing the level of a signal on a data transmission means at a remote location in response to a test control signal from a central location in a data communications network, said apparatus being located at the remote location and comprising:

A. first means for establishing an acceptable range of signal levels,

B. second means connected to the data transmission means for generating continously a line level signal in response to the signals on the data transmission means,

C. means connected to said first means for generating a status signal that indicates when the line level signal is within the predetermined range, and

D. means responsive to the receipt of the test control signal for transmitting a message back to the central location that indicates the status of the line level signal and thereby the level of the signals on the data transmission means.

4,055,809

AMPLIFYING DEVICE

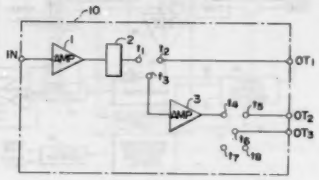
Takeshi Takeuchi, and Mitsuo Takahashi, both of Tokyo, Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed Apr. 13, 1976, Ser. No. 676,451

Claims priority, application Japan, Apr. 18, 1975, 50-52733[U]

Int. Cl.[2] H04H *1/02*

U.S. Cl. 325—308 **3 Claims**



2. A universal repeator for TV systems having a common antenna, comprising

a receptacle housing having two sets of terminal sockets, and two plugs having jacks adapted to fit said terminal socket sets in selected positions,

said housing also having a TV signal input terminal and a plurality of TV signal output terminals,

said housing also containing electronics signal amplitude modifying circuit means including said terminal sockets and said TV signal input and output terminals, and

the first plug containing a directional coupler circuit, and the second plug containing a signal distributing circuit,

whereby junctions of the circuit means can be adjusted by changing the angular positions of said plugs with respect to the corresponding terminal sockets without any output at the TV signal output terminals.

4,055,810

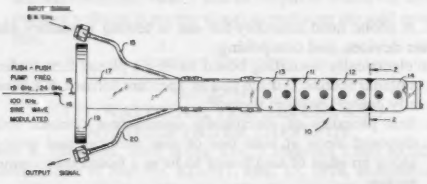
INDEPENDENT GAIN AND BANDWIDTH CONTROL OF A TRAVELING WAVE MASER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and David L. Trowbridge, Sunland, Calif.

Filed July 26, 1976, Ser. No. 708,796

Int. Cl.[2] H01S *1/02*

U.S. Cl. 330—4 **12 Claims**



1. In a traveling wave solid-state maser having a folded-comb structure with an input-output end and a turn-around end, said maser being designed for operation in a push-push pump mode using separate pump frequencies, and said maser having an external magnetic field that is uniform across the full length of the folded comb structure, the combination comprising:

an adjustable electromagnetic means for aiding said uniform external magnetic field to a desired bandwidth control level over

half the length of said folded comb structure at a turn-around end thereof;

an adjustable electromagnetic means for bucking said uniform external field to said desired bandwidth control level over half the length of said folded comb structure at an input-output end thereof;

an adjustable electromagnetic means for further aiding said uniform external field to a desired gain control level over one quarter of the length of said folded comb structure from substantially the center of said folded comb structure out toward said turn around; and

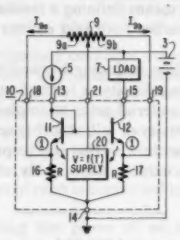
an adjustable electromagnetic means for further bucking said uniform external field to said desired gain control level over one quarter of the length of said folded comb structure from substantially the center of said folded comb structure back toward said input-output end.

4,055,811

TRANSISTOR AMPLIFIERS

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,589
Int. Cl.² H03F *1/32, 3/04*
U.S. Cl. 330—289 **5 Claims**



1. In a transistor amplifier including:

first and second transistors of the same conductivity type, both fabricated from the same basic semiconductor material and operated at substantially the same absolute temperature T, each having base and emitter and collector electrodes, each having a base-emitter junction between its base and emitter electrodes, each having a collector-base junction between its collector and base electrodes;

first and second resistances exhibiting similar coefficients of change with change in temperature and being operated at substantially said absolute temperature T;

said first resistance having a first end connected to the emitter electrode of said first transistor and having a second end, and said second resistance having a first end connected to the emitter electrode of said second transistor and having a second end;

an interconnection of the second ends of said first and said second resistances;

means for applying substantially the same quiescent potentials to the base electrodes of said first and said second transistors, of a polarity respective to a potential at said interconnection for forward-biasing the base-emitter junction of said first and said second transistors;

means for applying a quiescent potential to the collector electrode of said first transistor to condition it for normal transistor operation; and

means for applying a quiescent potential to the collector electrode of said second transistor to condition it for normal transistor operation, an improvement for controlling the ratio between the collector currents of the first and second transistors substantially independently of temperature in the operating temperature range of said first and second transistors which improvement comprises:

means for developing across said first resistance a potential drop linearly proportional to T in the operating temperature range of said first and second transistors;

means for developing across said second resistance a potential drop linearly proportional to T in the operating temperature range of said first and second transistors; and

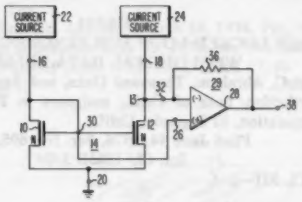
means for adjusting at least one of the potential drops across said first and second resistances relative to the other.

4,055,812

CURRENT SUBTRACTOR

Bruce David Rosenthal, Randolph, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,122
Int. Cl.² H03F *3/45*
U.S. Cl. 330—253 **10 Claims**



1. A circuit for obtaining an output signal proportional to the difference between a first input signal current and a second input signal current comprising, in combination:

a current mirror amplifier (CMA) having an input terminal to which said first input signal current is applied, an output terminal to which said second input signal current is applied, and a common terminal connected to a point of reference potential;

a source of bias voltage;

a differential-input amplifier having an inverting input terminal coupled to said output terminal of said CMA, a non-inverting input terminal connected to said source of bias voltage, and an output terminal from which said output signal can be taken; and

means connecting said differential-input amplifier as a current-to-voltage converter, which means includes

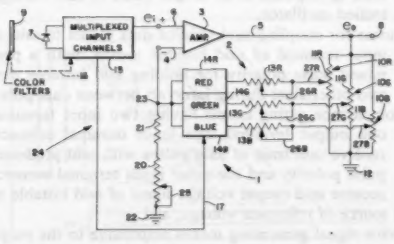
a direct current feedback path through a resistance connected between said output and said inverting terminals of said amplifier.

4,055,813

SINGLE ADJUSTMENT MULTIPLE FUNCTION CALIBRATION CIRCUIT

Park French, Aurora, Ohio, assignor to Sterndent Corporation, Mount Vernon, N.Y.

Filed June 16, 1976, Ser. No. 696,787
Int. Cl.² H03F *1/36*
U.S. Cl. 330—103 **19 Claims**



16. A circuit for adjustably controlling the fractional amounts of permissible ranges of change of the basic gains of a multiplexed amplifier circuit, which has a plurality of voltage

divider feedback channels selectively coupled therein to provide the amplifier circuit with different respective basic gains, to compensate the amplifier circuit for different respective amounts of drift or the like, comprising:

variable impedance means coupled in each of said feedback channels for determining the respective permissible ranges of change of the basic gain of the amplifier circuit as a percentage of the basic gain thereof when the respective feedback channels are operatively coupled therein, and

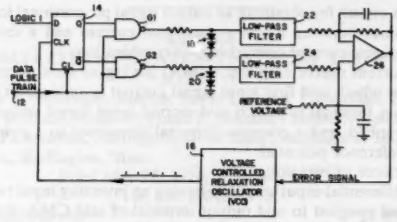
single adjustable impedance means operatively connectable to all of said feedback channels for controlling simultaneously the fractional amount of the permissible ranges of change that the basic gain with respect to each feedback channel is changed in response to the magnitude of the impedance of said adjustable impedance means.

4,055,814

PHASE LOCKED LOOP FOR SYNCHRONIZING VCO WITH DIGITAL DATA PULSES

Robert C. Abraham, Thousand Oaks, and James E. D. Cline, Northridge, both of Calif., assignors to Pertec Computer Corporation, El Segundo, Calif.

Filed June 14, 1976, Ser. No. 695,323
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—1 A **4 Claims**



1. A phase-locked-loop phase detector for synchronizing pulse outputs of a voltage controlled oscillator with a train of data pulses spaced apart in integral multiples of a fundamental clock period comprising

bistable means for providing an output voltage signal at an output terminal and having two input terminals, a first input terminal for triggering said bistable means into one state with said output voltage signal at a first predetermined level, and a second input terminal for holding said bistable means in another state with said output voltage signal at a second predetermined voltage level in response to a signal of a predetermined one of said high and low voltage signal levels,

means for coupling the output pulses of said voltage controlled oscillator to said first terminal of said bistable means, thereby triggering said bistable means into said one state in response to an output pulse of said voltage controlled oscillator,

means for coupling said train of data pulses to said second input terminal of said bistable means, with a predetermined pulse polarity for holding said bistable means in said other state during intervals between data pulses,

coincidence gating means having two input terminals and one output terminal, one input terminal connected to receive said train of data pulses with said predetermined pulse polarity and the other input terminal connected to receive said output voltage signal of said bistable means,

a source of reference voltage, and

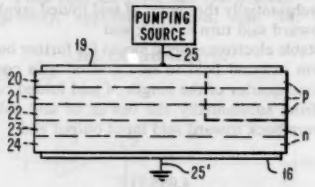
error signal generating means responsive to the output terminal of said gating means and said reference voltage for producing a phase error signal proportional to the pulse width of pulses at the output terminal of said gating means for control of said voltage controlled oscillator.

4,055,815

Q-SWITCHING INJECTION LASER WITH OXYGEN IMPLANTED REGION

Archibald W. Smith, Briarcliff Manor, N.Y., assignor to International Business Machines, Armonk, N.Y.

Filed Dec. 24, 1975, Ser. No. 643,972
Int. Cl.[2] H01S *3/19*
U.S. Cl. 331—94.5 H **7 Claims**



1. A Q-switching GaAs injection laser comprising a monocrystalline GaAs semiconductor body including distinct emitter and absorber sections with a single pumping source conductivity connected to a single electrode overlying said laser, said body including means defining a resonant cavity, wherein

said electrode overlies both said emitter and absorber sections,

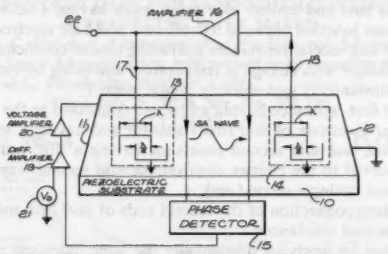
said absorber section including implanted ions of a dose to provide a doping density at least about twice the doping density of the material prior to implantation so as to increase the resistivity of said absorber section, as compared to said emitter section, so that said respective absorber and emitter sections exhibit, respectively, absorber and emitter characteristics.

4,055,816

VOLTAGE STRESS STABILIZED SAW DEVICE

Robert M. Woskow, Canoga Park, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 26, 1976, Ser. No. 708,869
Int. Cl.[2] H03B *3/04, 5/30*
U.S. Cl. 331—32 **10 Claims**



1. A device such as an oscillator, having a surface acoustic wave frequency determining element, comprising:

a substrate of piezoelectric material having a planar surface;

first and second transducers each having interleaved interdigital finger transducers affixed to said planar surface for launching and receiving surface acoustic waves on said planar surface, respectively;

phase detecting means connected to monitor said surface acoustic waves and to generate a control signal as a function of a change of wavelength of said acoustic waves on said planar surface;

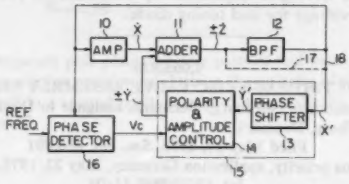
and means for applying said control signal as a stress-inducing signal producing a potential gradient within said substrate in the direction of propagation of said surface

waves, said control signal being applied in a sense tending to compensate for said changes of wavelength of said acoustic waves.

4,055,817
VARIABLE FREQUENCY OSCILLATOR

Yasuaki Watanabe; Yukio Okabe; Mitsuru Hayakawa; Yuichi Ikemura, all of Yokohama; Yasuhiro Fujita, and Daisuke Murakami, both of Kadoma, all of Japan, assignors to Matsushita Electric Industrial Company Limited and Victor Company of Japan, Limited, both of, Japan

Filed Oct. 29, 1976, Ser. No. 736,777
Claims priority, application Japan, Oct. 30, 1975, 50-130709
Int. Cl.² H03B *3/04, 5/12*
U.S. Cl. 331—117 R **9 Claims**



1. A variable frequency oscillator comprising:

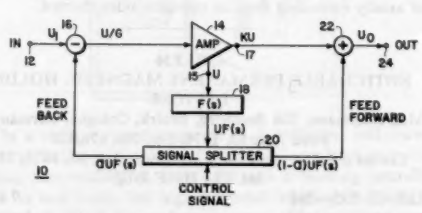
an oscillating loop including an amplifier, bandpass filter means having a passband response characteristic with the center frequency substantially equal to a free-running frequency of said oscillating loop and means having two inputs for providing vector summation of two signals applied thereto, all of which are connected in series such that the output of each is connected to an input of another; and

means for shifting the phase of an input signal applied thereto such that the phase shift is variable in correspondence to a control signal applied thereto, said variable phase shifting means having an input connected to an arbitrary point of said oscillating loop and an output connected to the other input of said summation providing means.

4,055,818
TONE CONTROL CIRCUIT

Michael J. Gay, Geneva, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 9, 1976, Ser. No. 675,396
Int. Cl.² H03H *7/10*
U.S. Cl. 333—28 T **18 Claims**



1. In an electronic circuit for receiving, and processing an audio signal, a control circuit for varying the frequency response of the electronic circuit, comprising:

means responsive to the audio signal for producing a signal of which the magnitude thereof is dependent on the frequency of the audio signal;

circuit means, coupled to said means for producing a frequency dependent signal, which is adapted to receive an externally supplied control signal, for electronically dividing said frequency dependent signal into a feedback and a feed forward signal, the ratio of said feedback signal to said feed forward signal being varied in accordance with the magnitude of said control signal;

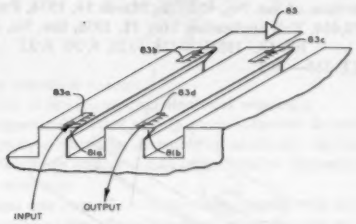
means for combining said feedback signal with said audio signal to vary the frequency response of the electronic circuit in a first prescribed manner; and

means for combining said feed forward signal with the audio signal to vary the frequency response of the electronic circuit in a second prescribed manner.

4,055,819
ACOUSTIC RIDGE DELAY LINE

Robert S. Wagers, Richardson, and Clinton S. Hartmann, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 451,718, March 15, 1974, Pat. No. 3,974,464. This application May 13, 1976, Ser. No. 685,968
Int. Cl.² H03H *9/26, 9/30, 9/32;* **H01L** *41/18*
U.S. Cl. 333—30 R **9 Claims**



1. An acoustic delay line comprising:

a substrate;

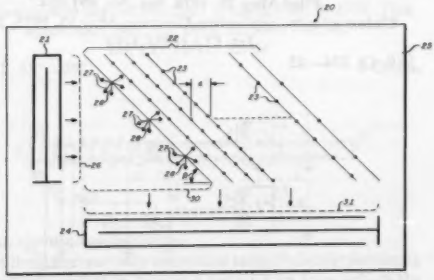
a horizontal ledge extending outwardly from said substrate with the top of the ledge being coplanar with the top surface of said substrate, said ledge being at least partially made of piezoelectric material, said substrate and said ledge defining an acoustic waveguide; and

an input transducer deposited on one end of said ledge and an output transducer deposited on the other end of said ledge.

4,055,820
REFLECTIVE DOT ARRAY FOR ACOUSTIC WAVE PROCESSING

Leland P. Solie, Acton, Mass., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 5, 1975, Ser. No. 638,117
Int. Cl.² H03H *9/04, 9/26, 9/30, 9/32*
U.S. Cl. 333—30 R **25 Claims**



1. An apparatus for processing acoustic waves comprising:

a substrate capable of supporting surface acoustic waves on a surface thereof;

an input transducer for launching acoustic waves in a predetermined propagation direction on said surface;

an array formed by a multiplicity of discrete scatterers on said surface, each of which is of dimensions that are less than a wavelength of said launched acoustic waves and positioned to scatter surface acoustic waves launched in said predetermined direction, said scattered acoustic waves contributing to the formation of reflected surface waves, that propagate at a preselected angle relative to said propagation direction, which are related to said launched acoustic waves through a transfer function that is substantially defined by the dimensions of said scatterers and their relative positioning within said array; and

an output transducer for receiving said reflected surface waves.

4,055,821

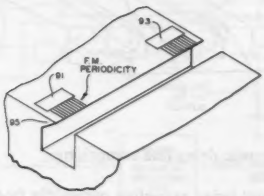
ACOUSTIC RIDGE TRANSVERSAL FILTER

Robert S. Wagers, Richardson, and Clinton S. Hartmann, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 451,718, March 14, 1974, Pat. No. 3,974,464. This application May 11, 1976, Ser. No. 685,243

Int. Cl.² H03H *7/28, 9/26, 9/30, 9/32*

U.S. Cl. 333—70 T **7 Claims**



1. A transversal filter comprising:

a substrate;

a horizontal ledge having at least a top surface portion thereof made of piezoelectric material, said ledge extending outwardly from said substrate with the top surface portion of said ledge being coplanar with the top surface of said substrate, said substrate and said ledge defining an acoustic waveguide; and

at least one tapped transducer deposited on said ledge comprising a transducer pad having a plurality of electrode fingers extending therefrom in a lateral direction toward the edge of said ledge.

4,055,822

TUNING CIRCUIT ARRANGEMENT

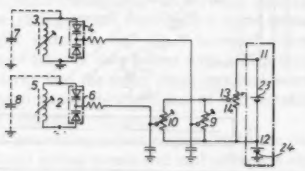
Heinz Rinderle, Heilbronn, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed May 28, 1976, Ser. No. 691,024

Claims priority, application Germany, May 31, 1975, 2524171

Int. Cl.² H03J *3/18*

U.S. Cl. 334—15 **5 Claims**



1. A circuit for adjusting a tuning circuit, the tuning circuit including at least one resonant circuit composed of a variable inductance and a variable capacitance constituted by at least one voltage-variable tuning diode, one side of the resonant circuit being connected to a point at circuit ground potential and adjustment of the resonant circuit being effected by changing the resonant circuit inductance and the resonant circuit capacitance, with changing of the resonant circuit capacitance being effected exclusively by varying the tuning voltage of the tuning diode, the tuning circuit further including a source of a variable tuning potential which is variable over a range between maximum and minimum extreme values, each extreme value being different from the circuit ground potential, and said circuit for adjusting comprising at least one adjustment potentiometer connected between a point of said source providing the variable tuning potential and a point of said source permanently providing one of said extreme values, said potentiometer having an adjustable tap connected to provide the tuning voltage for said tuning diode.

4,055,823

ELECTROMAGNETIC VALVE ASSEMBLY MEANS

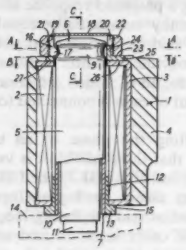
Erik Andersen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed May 17, 1976, Ser. No. 686,891

Claims priority, application Germany, May 22, 1975, 2522677

Int. Cl.² F16K *31/06*

U.S. Cl. 335—255 **3 Claims**



1. An electromagnetic valve assembly comprising, a valve casing, a tube member attached to said casing at one end thereof and having an annularly shaped recess at the other end thereof, a coil surrounding said tube member, a U-shaped yoke partially surrounding said coil having an upper leg spaced from said recess, a housing surrounding said coil and said yoke, an externally threaded axially slotted ring having an internal bead receivable in said recess, a nut threaded on said ring biasing said housing towards said valve casing, and ring having a pair of axially extending slots on opposite sides thereof.

4,055,824

SWITCHABLE PERMANENT MAGNETIC HOLDING DEVICES

Max Baermann, 506 Bensberg, Bezirk, Cologne, Germany

Filed Apr. 12, 1976, Ser. No. 676,135

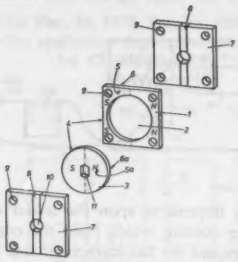
Claims priority, application Germany, Apr. 12, 1976, 2517364

Int. Cl.² H01F *7/02*

U.S. Cl. 335—288 **7 Claims**

1. A switchable permanent magnetic holding device for releaseably holding ferromagnetic objects, comprising at least two spaced pairs of flat at least first and second pole plates separated by a non-magnetic medium; first and second permanent magnets disposed in the space between said pairs of pole plates, said first magnet being in the form of a flat plate of permanent magnet material and having a circular opening therethrough, said second magnet being in the form of a circular disc of permanent magnet material disposed in said opening and relatively movable to said first magnet, said magnets being

magnetized in a direction through pole plates and each having at least two magnetic pole pairs of opposite magnetic polarity, the pole pairs of said first magnet and said second magnet each



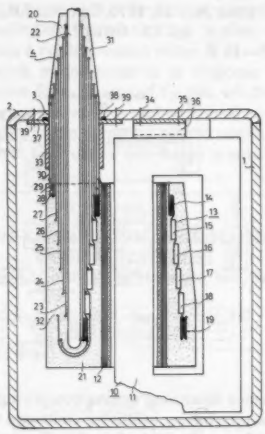
facing a separate pole plate, the pole pairs of said second magnet in one relative position reinforcing the polarity of said first magnet and in a second position opposing the polarity of said first magnet.

4,055,825

VOLTAGE TRANSFORMER FOR HIGH VOLTAGE

Gerhard Kleen; Heinz Schiemann, and Karl Allmendinger, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Nov. 29, 1976, Ser. No. 745,692
Claims priority, application Germany, Nov. 28, 1975, 2554143
Int. Cl.[2] H01F *15/14, 27/00*
U.S. Cl. 336—70 **11 Claims**



1. In a voltage transformer for high voltages, said transformer including an insulating body carrying a high potential winding surrounding an iron core and a bushing laterally joined to said body, the high potential winding including a plurality of subwindings whose spacings from said iron core increase stepwise with voltage, the improvement comprising:

a plurality of control electrodes in the form of conducting cylinders disposed concentrically with respect to the longitudinal axis of the bushing, thereby providing control of said bushing at both its ends;

said high potential winding being arranged adjacent a side of the bushing so that its width extends over the control length of said side;

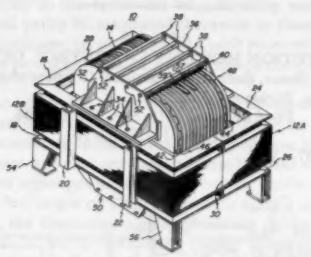
and said subwindings being metallically connected to the respective conducting cylinders so as to cause a uniform voltage distribution during surge voltages.

4,055,826

RESILIENTLY SUPPORTED WINDINGS IN AN ELECTRICAL REACTOR

Joseph Phillip Franz, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Apr. 29, 1976, Ser. No. 681,724
Int. Cl.[2] H01F *27/30*
U.S. Cl. 336—100 **11 Claims**



1. In an electrical reactor:

a. a stack of interconnected electrical windings;

b. a magnetizable core having outer members formed in a generally rectangular assembly substantially surrounding said windings and having an inner member disposed inside said windings;

c. at least one pair of cross members respectively disposed adjacent to sides of said windings in quadrature with said outer members and each having opposite ends fixedly attached to said outer members; and

d. resilient means for restricting relative movement of said windings, said resilient means comprising:

i. a first ripple spring assembly disposed in compression between said windings and a part of said outer members that is adjacent to said windings,

ii. a second ripple spring assembly disposed in compression between said windings and a part of said inner member that is adjacent to said windings, and

iii. a third ripple spring assembly disposed in compression between said windings and a first one of said cross members,

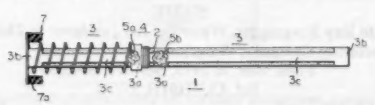
each of said ripple spring assemblies comprising an insulating sheet impregnated with a curable plastic resin and formed in a substantially uniform ripple pattern.

4,055,827

ELECTRIC FUSE

Edward J. Knapp, Jr., Merrimac, Mass., assignor to Gould, Inc., Newburyport, Mass.

Continuation-in-part of Ser. No. 739,555, Nov. 8, 1976. This application Nov. 10, 1976, Ser. No. 740,402
Int. Cl.[2] H01H *85/04*
U.S. Cl. 337—297 **4 Claims**



1. An electric fuse including

a. an elongated partially metal clad strip of electric insulating material, said strip having a center area from which the metal overlay is entirely removed to form an insulting gap;

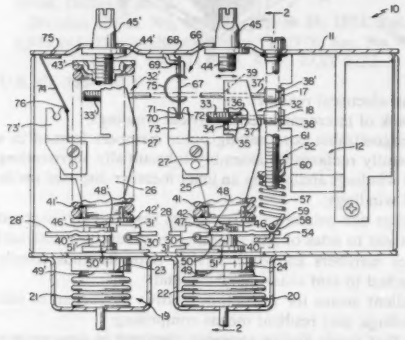
b. a bridge member extending across said insulating gap and conductively interconnecting portions of said metal overlay left on said strip;
c. a pair of soft solder joints effecting said conductive interconnection;
d. said bridge member having a pair of arms projecting beyond said elongated metal clad strip;
e. a helical extension spring having a relatively small diameter at one end and a relatively large diameter at the other end thereof, said one end of said spring being affixed to said arms of said bridge member; and
f. a tubular member of insulating material supporting said large diameter end of said spring.

4,055,828

CONDITION RESPONSIVE CONTROL DEVICE

Werner R. Bauer, Radnor, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed July 16, 1975, Ser. No. 596,104
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—308 **14 Claims**



1. In a control device having a housing means carrying a condition responsive means and an electrical switch to be operated by said condition responsive means, said housing means having a pivotally mounted lever to translate motion from a movable wall of said condition responsive means to said switch and having a range spring means to oppose movement of said movable wall in one direction thereof, an actuator disposed between said movable wall of said condition responsive means and said range spring means and being engageable therewith, said actuator being unitary between said movable wall and said range spring means and carrying a pin that is operatively associated with said lever to cause pivoting movement of said lever as said actuator is moved relative to said housing means, said actuator having opposed ends for respectively engaging said range spring means and said movable wall of said condition responsive means, the improvement wherein said range spring means has misalignment compensating means engaging its respective end of said actuator.

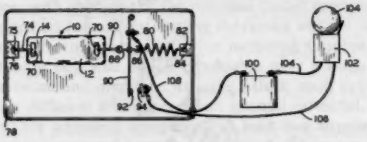
4,055,829

FUSIBLE LINKS AND PROCESS FOR PRODUCING SAME

Donald Ray Ruegsegger, Waterloo, Ind., assignor to Elsie Manufacturing Company, Waterloo, Ind.

Filed Mar. 3, 1975, Ser. No. 554,650
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—416 **5 Claims**

1. A non-creeping, break-away fuse consisting of a pair of substantially flat, thin cross-section internested rectangular plates which are constructed to be complementarily interfitted, one within the other, and each including a marginal flange extending around at least two of the opposite edges thereof, and when in internested relation are confronting one with respect to the other, a triangular indentation one along each of the opposite two edges of said flanges which are interfitted and caused to ride one against the other to force said links perpendicularly apart when either of said links is moved longitudinally relatively to the other against the connection whose



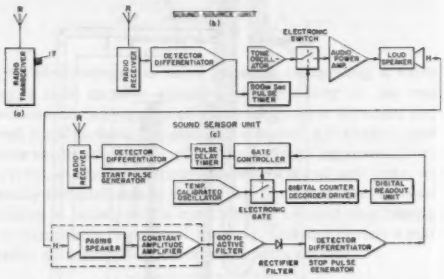
strength is solely dependent upon the solder connection, a non-tucked solder coating which fuses the confronting surfaces of said edges and the flat surfaces of said links together and is adapted to sudden non-creeping release of such connection at a predetermined temperature.

4,055,830

SONIC MEASURING SYSTEM

Wallace C. Wilson, Vancouver, Wash., and Ralph W. Shoemaker, Portland, Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 14, 1976, Ser. No. 705,362
Int. Cl.[2] G01S *11/00*
U.S. Cl. 340—16 R **8 Claims**

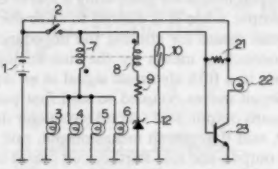


1. A distance measuring system comprising:
a sound source having means for emitting a sound wave with a fixed frequency in the lower audio range;
a sound sensor separated from said sound source the distance to be measured for sensing the emitted sound wave, said sensor having counting means and means for displaying the distance measured between the sound source and sensor;
a radio transmitter for simultaneously transmitting a wave of fixed frequency to both said sound source and sound sensor to trigger both the sending of the sound wave and the initiation of the counting cycle by said sensor's counting means; and
means in said sound sensor for stopping said counting cycle when said emitted sound wave first is received thereat;
said counted cycles being a function of said distance to be measured and displayed at said means for displaying.

4,055,831
SYSTEM FOR INDICATING INTERRUPTION IN OPERATION OF AUTOMOTIVE LAMPS

Yasuhiko Sakurai; Toshio Ishida, and Teruo Kusumoto, all of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 10, 1975, Ser. No. 639,347
Claims priority, application Japan, Dec. 11, 1974, 49-150571
Int. Cl.[2] B60Q 1/26
U.S. Cl. 340—80 2 Claims

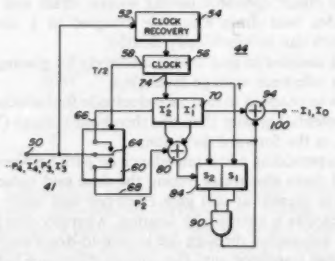


1. A system for indicating interruption in operation of automotive lamps comprising;
a voltage source;
a plurality of automotive lamps;
a switch and a current winding connected between said source and said automotive lamps, said switch being operable to connect said source to the lamps for energization thereof and for passing current through said winding thereby generating magnetomotive force in proportion to the amount of current flowing therethrough;
a voltage winding connected to said source via said switch for generating a magnetomotive force opposite to that generated by said current winding;
a zener diode connected in series with said voltage winding for allowing current to flow from the source through said voltage winding only when voltage applied across said diode exceeds a predetermined value;
additional switch means actuated in response to the net magnetomotive force generated by said windings; and
indicating means connected to said additional switch means and responsive to the actuation of said additional switch means when at least one of said lamps is inoperative.

4,055,832
ONE-ERROR CORRECTION CONVOLUTIONAL CODING SYSTEM

John En, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sept. 24, 1975, Ser. No. 616,337
Int. Cl.[2] G06F 11/12
U.S. Cl. 340—146.1 AQ 16 Claims



12. In an error correcting system for correcting random errors in a parity encoded bit stream having no more than every fourth successive bit in error, a decoder for extracting and correcting information bits from the stream, the decoder comprising:
means for receiving the bit stream;
information bit sample and storage means having only two stages, the information bit sample and storage means having a first stage coupled to the receiving means for receiving the information bits and a last stage;
syndrome bit generating means having inputs and an output, the inputs being connected to the first and last stage of the information bit sample and storage means, and to the receiving means, the syndrome bit generating means including modulo-2 adder means for taking the modulo-2 sum of the received information bits stored in the stages connected to the syndrome bit generating means and a received parity bit associated therewith to thereby generate a syndrome bit in response to each received parity bit and the stored information bits associated therewith at the output;
syndrome bit sample and storage means having two stages, the syndrome bit sample and storage means having a first stage connected to the output of the syndrome bit generating means for receiving the syndrome bits, and a last stage;
correction signal generating means having inputs connected to the two stages of the syndrome bit sample and storage means, the correction signal generating means being responsive to the syndrome bits stored in the stages connected thereto for providing a correction signal at the output thereof only when both of the stored syndrome bits have the same predetermined value;
correcting means connected to the last stage of the information bit sample and storage means and the output of the correction signal generating means for correcting information bits received from the information bit sample and storage means in response to the correction signal from the correction signal generating means; and
clock means connected to the information bit sample and storage means and the syndrome bit sample and storage means for sequentially shifting each of the information bits and the syndrome bits, respectively, through each of the respective sample and storage means from the respective first stage to the respective last stage thereof.

4,055,833
METHOD OF DERIVING CHARACTERISTIC CONTOURS FROM A COLORED PICTURE

Rolf Erik Rothfjell, Luntmakargatan 52, Box 3254, S-103 65 Stockholm 3, Sweden

Filed June 10, 1975, Ser. No. 585,668
Claims priority, application Sweden, June 14, 1974, 7407887
Int. Cl.[2] G06K 9/08
U.S. Cl. 340—146.3 E 5 Claims

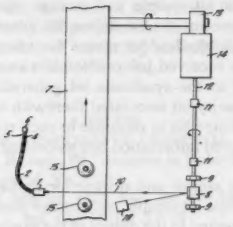
1. A method of producing an identity document comprising the steps of making corresponding multicolored and blue monochromatic photographs of the face of a person to be identified, the monochromatic photograph being made with the contrast of the image enhanced so that only areas of great color intensity are reproduced, and mounting both photographs on a support.

4,055,834

METHOD AND A DEVICE FOR AUTOMATIC PATTERN RECOGNITION OF LIQUID CONTAINERS

Tore Planke, 3180 Nykirke, Norway

Filed May 27, 1976, Ser. No. 690,466
Claims priority, application Norway, June 3, 1975, 751950
Int. Cl.[2] G06K 9/00
U.S. Cl. 340—146.3 F **12 Claims**



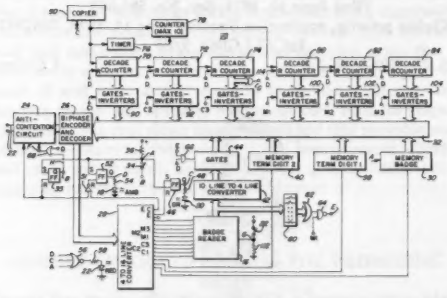
1. A method for automatic recognition of containers of varying size and shape comprising storing data related to container sizes and shapes in a memory unit, transporting containers to be recognized along a transport path at a first speed, disposing a light receiving unit comprising a plurality of receivers on one side of said path, directing a narrow beam of light from the other side of said path to fall on said light receiving unit, causing said light beam to strike each receiver sequentially, repeating said process of causing said light beam sequentially to strike each receiver, cyclically at a rate directly related to said first speed, generating, in a form compatible with said data, signals distinguishing between those receivers obscured by a container passing said light receiving unit and those not so obscured and comparing said signals with said data to identify that container.

4,055,835

LINE-SEIZING APPARATUS

Douglas R. Thornton, Maywood, and Jerome Smiglee, Chicago, both of Ill., assignors to Manitou Systems, Inc., Bensenville, Ill.

Continuation of Ser. No. 605,754, Aug. 18, 1975, abandoned. This application July 2, 1976, Ser. No. 702,001
Int. Cl.[2] H04Q 3/00
U.S. Cl. 340—147 LP **11 Claims**



1. Line-seizing apparatus for establishing communication over a data line used in association with apparatus for generating an electric signal on the data line, said electric signal having a parameter with a nominal value when the data line is not in use, and comprising:

connecting means for coupling the line-seizing apparatus to the data line;

first parameter detection means coupled to said connecting means and generating a first electrical signal at an output when the parameter of the signal at said connecting means differs from the nominal value by an amount not exceeding a first predetermined amount;

second parameter detection means coupled to said terminal means and generating a second electrical signal at an output when the parameter of the signal at said connecting means differs from the nominal value by an amount not less than a second predetermined amount, said second predetermined amount being greater than said first predetermined amount;

first circuit means for repetitively generating a third electrical signal at an output;

second circuit means for generating a fourth electrical signal at an output when it is desired to seize the data line;

third circuit means for altering the impedance presented at said connecting means by the line-seizing apparatus in response to a fifth electrical signal at an input; and

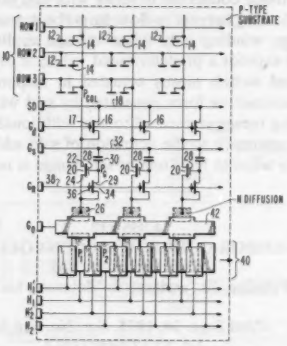
fourth circuit means coupled to said first parameter detection means output, said second parameter detection means output, said first circuit means output, said second circuit means output, and said third circuit means input for applying said fifth electrical signal to said third circuit means input in response to the simultaneous occurrence of said first, third, and fourth electrical signals and preventing said fifth electrical signal from being applied to said third circuit means input in response to the occurrence of said second electrical signal.

4,055,836

CHARGE TRANSFER READOUT CIRCUITS

Paul Kessler Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 26, 1976, Ser. No. 718,075
Int. Cl.[2] G11C 7/06; H04N 3/14
U.S. Cl. 340—173 R **20 Claims**



1. In combination:

a field effect transistor having source, drain and gate electrodes, said drain electrode coupled to a circuit point which can be electrically floated;

means coupled to said source electrode for placing the same at a reference voltage level (V_c);

means ac coupled to said gate electrode for inducing thereon a potential greater than one threshold voltage (V_{th}) above V_c, in the forward direction;

means providing a low impedance dc path between said gate and drain electrodes during the time said induced potential is present at said gate electrode and while said drain electrode is electrically floating, whereby charge carriers are conducted through the source-to-drain electrode path of said transistor until the voltage difference between said source and gate electrodes reduces to a value substantially equal to V_{th}, whereupon conduction ceases through said source-to-drain electrode path; and

means for opening said dc path while said voltage difference

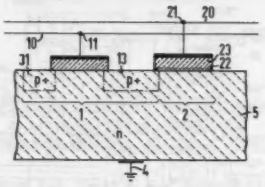
between said source and gate electrodes is substantially equal to V_{th}, whereby a quiescent forward bias V_{th} is established between said source and gate electrodes.

4,055,837

DYNAMIC SINGLE-TRANSISTOR MEMORY ELEMENT FOR RELATIVELY PERMANENT MEMORIES

Karl-Ulrich Stein, Munich, and Karlheinrich Horninger, Eglharting, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Oct. 22, 1975, Ser. No. 624,710
Claims priority, application Germany, Oct. 22, 1974, 2450116
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **23 Claims**



1. Dynamic single-transistor memory element connected to a word line and a bit line comprising:

a transistor having at least two terminals and a gate terminal, connected at one of said terminals with said bit line and at said gate terminal with said word line;

a capacitor having at least two electrodes connected at one of said electrodes in series to one of said two terminals of said transistor;

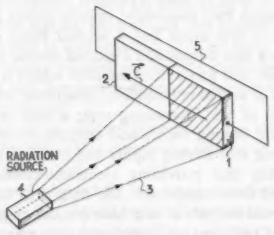
wherein said single-transistor memory element comprises a write line, said capacitor is a metal dielectric semiconductor capacitor, said dielectric comprises a pluraliy of selective activation states and said electrode which is not connected with said transistor is connected with said write line.

4,055,838

FERROELECTRIC INFORMATION OPTICAL STORAGE DEVICE WITH SELF BIASING

Jean Pierre Huignard, and François Micheron, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 7, 1976, Ser. No. 684,385
Claims priority, application France, May 16, 1975, 75.15438
Int. Cl.² G11B *7/02, 9/02*
U.S. Cl. 340—173.2 **6 Claims**



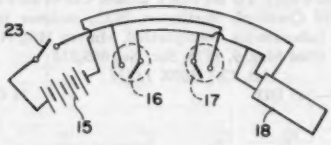
1. An information optical storage device comprising a lightly doped non-reduced ferroelectric cyrstal for holographic storage of information, a heavily doped reduced photocell crystal, having an absorption frequency band, adapted for being photoexcited by means of a uniform luminuous radiation having a frequency band within said absorption band, said photocell crystal thus producing an electrical field, and direct connecting means for applying said electrical field to said ferroelectric crystal, being formed by the common edge between the two crystals and by a conductor wire connecting the two faces opposite the said common edge, said ferroelectric crystal having a very much higher resistivity than said photocell crystal.

4,055,839

FOALING ALARM

Leonard T. Skeggs, Kirtland, Ohio, assignor to Locust Farms, Inc., Kirtland, Ohio

Continuation-in-part of Ser. No. 598,749, July 25, 1975, abandoned. This application June 23, 1976, Ser. No. 698,948
Int. Cl.² G08B *21/00*
U.S. Cl. 340—279 **21 Claims**



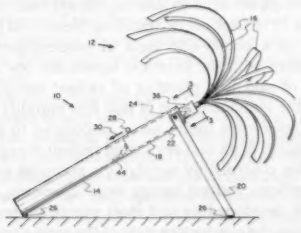
1. A foaling alarm for signalling the foaling of a mare comprising a device adapted to encircle a mare's body and including an upper portion having a recess to embrace the withers to prevent circumferential displacement of said device, and a flexible girth means connected to said upper portion to engage under the forepart of the belly behind the front legs; transmitter means and position sensing switch means carried by said upper portion; said transmitter means, when energized, being operative to emit a signal of predetermined frequency; said position sensing switch means being operative to energize said transmitter means only when the mare is in foaling position on her side; and remote receiver and alarm signal system means; said receiver means being tuned to said transmitter signal and operative in response thereto to actuate said alarm signal system to provide an alarm signal for summoning aid to facilitate the birth of the foal.

4,055,840

REUSABLE SAFETY WARNING DEVICE

Anton R. Uchytil, 4265 NE. Halsey, Apt. 212, Portland, Oreg. 97213, and Ray L. Gorder, 10 SW. Ash, Portland, Oreg. 97204

Filed Mar. 1, 1976, Ser. No. 662,713
Int. Cl.² G08C *5/00*
U.S. Cl. 340—321 **9 Claims**



1. A reusable safety warning device, comprising an elongate tubular body member, a plurality of thin, streamer-like, flexible shiny strips of glossy reflective material attached to said body member and adapted to protrude longitudinally outward from one end thereof for a first portion of their respective lengths, diverge from one another in a plurality of directions for a second portion of their respective lengths and then droop at their protruding ends under the force of gravity so as to produce a pompon-like array of said strips, and means partially

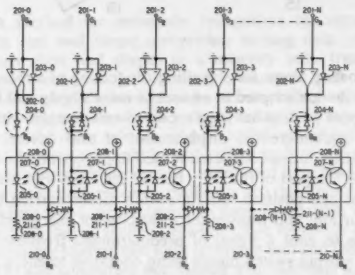
disposed within said body member for retracting said flexible strips into said body member.

4,055,841

OPTICAL GRAY TO BINARY CODE CONVERTER

Charles David Crawford, Burlington, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 9, 1976, Ser. No. 665,332
Int. Cl.[2] H03K *13/24*
U.S. Cl. 340—347 DD 11 Claims



1. Apparatus for converting information bits in a first binary code to information bits in a second binary code which comprises:

a plurality of input means for supplying a corresponding plurality of signals representative of information bits in the first binary code ordered in a predetermined sequence from a most significant bit to a least significant bit;

a first plurality of radiant energy emitting means associated with and connected on a one-to-one basis in predetermined circuit relationship with the individual ones of said plurality of input means in said sequence; and

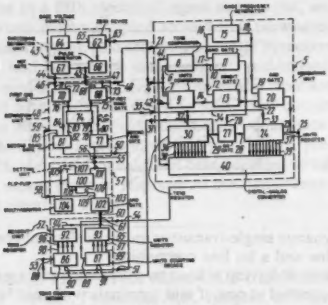
a first plurality of radiant energy responsive means associated on a one-to-one basis with at least said most significant through the next to least significant ones of said first plurality of radiant energy emitting means and being connected on a one-to-one basis in predetermined circuit relationship with the next less significant one in said sequence of said first plurality of radiant energy emitting means, the individual ones of said first plurality of radiant energy responsive means being responsive to radiant energy emitted from said associated radiant energy emitting means for controllably supplying a potential to said next less significant radiant energy emitting means, wherein a potential developed by said most significant imput means determines the conductive state of the most significant one of said first plurality of radiant energy emitting means and wherein the conductive state of the individual remaining ones of said first plurality of radiant energy emitting means in said sequence is determined cooperatively by the potential supplied by said radiant energy responsive means connected in circuit relationship therewith and the potential developed by said associated input means, said conductive states of said first plurality of radiant energy emitting means being indicative of information bits in the second binary code.

4,055,842

DIGITAL DEVICE FOR MEASURING SINGLE AND MULTIPLE IMPACT IMPULSES

Alexandr Sergeevich Yakshin, ulitsa Malaya Filevskaya, 66, kv. 104; Oleg Nikolaevich Novikov, ulitsa Kuznetsky most, 18/7, kv. 6; Dmitry Alexeevich Grechinsky, ulitsa Tolbukhina, 8, korpus 2, kv. 48; Viktor Alexandrovich Klochko, ulitsa Oktyabrskaya, 38, kv. 374, and Viktor Georgievich Rygalin, 3-Dorozhny proezd, 5 korpus 2, kv. 103, all of Moscow, U.S.S.R.

Filed Dec. 22, 1975, Ser. No. 643,027
Claims priority, application U.S.S.R., Dec. 24, 1974, 2088810
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 AD 6 Claims



1. A digital device for measuring single and multiple impact impulses comprising: a converter for converting impact impulses into electrical signals; an amplifier of electrical signals, the input of which is connected to an output of said converter; an electrical signal filter, the input of which is connected to an output of said amplifier; a measuring unit, for measuring the peak value of impact pulses and having inputs and outputs, a first input of which is connected to an output of said filter; a tens comparator of said measuring unit having inputs; a units comparator of said measuring unit having inputs, a first input of said units comparator being connected to a first input of said tens comparator and together serve as said first input of said measuring unit; a successive separation unit, for successive separation of impact pulse time intervals and pauses therebetween, and having an input connected to said first input of said measuring unit and outputs; a base frequency generator of said measuring unit having an output; a separation unit, for separation of a first transcription pulse and a group of further reset pulses from a train of high-frequency pulses within a given interval between two successive impact pulses having inputs and outputs, a first input and a second input of which are connected to a first output and a second output of said successive separation unit and a third input of which is connected to a first output of said base frequency generator, which serves as a first output of said measuring unit; a tens register of said measuring unit having inputs and outputs; a units register of said measuring unit having inputs and outputs; gate means of said measuring unit providing electrical connection of the output of said tens comparator, the output of said units comparator and said outputs of said base frequency generator with said inputs of said tens and units registers; a reset line of said tens and units registers; a digital-analog converter of said measuring unit having a group of inputs connected to a group of outputs of said tens register and of outputs of said units register and having an output connected to a second input of a group of inputs connected to a group of said tens comparator and of said units comparator; a readout unit, for readout of information on single and multiple impact pulses, having inputs, a first and a second input being connected to the input of said tens register and of said units register, which serve respectively as a second and a third output of said separation unit and to said reset line

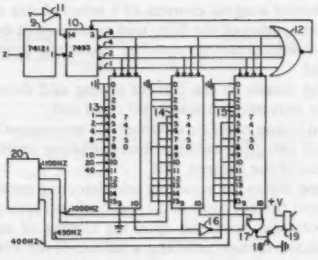
which serves as a second input of said measuring unit; a setting unit, for setting operational modes for measuring single and multiple impact pulses, having an input connected to a second output of said separation unit, a first output connected to a fourth input of said separation unit and a second output connected to a fourth input of said readout unit, said transcription pulses being effective to transfer the measured peak value information of the inpact pulses to storage means prior to a resetting of said measuring means by said resetting pulses, and the measurement of a next succeeding impact pulse, whereby the device is reset and prepared for further measurements in the interval between pulses.

4,055,843

ANNUNCIATOR FOR USE WITH ELECTRONIC DIGITAL CLOCK

Ranald O. Whitaker, 4719 Squire Drive, Indianapolis, Ind. 46241

Filed Feb. 23, 1976, Ser. No. 660,611
Int. Cl.² G04C *21/04*
U.S. Cl. 340—384 E **8 Claims**



1. An annunciator system comprising:

a source of data signals, a subset of said data signals at any particular instant being in a high state, the remaining subset of said data signals being in a low state;

initiator means adapted for delivering an initiation signal when an announcement is to be made;

a time slot generator for generating a sequence of time slots and adapted for receiving said initiation signal and in response thereto adapted for generating a sequence of sets of time slot signals, each of said sets identifying a respective time slot in said sequence of time slots;

an audio frequency signal generator means adapted for generating a low frequency signal and for generating a high frequency signal;

audio output means adapted for receiving an input signal and adapted for delivering in response thereto an audio tone of like frequency; and

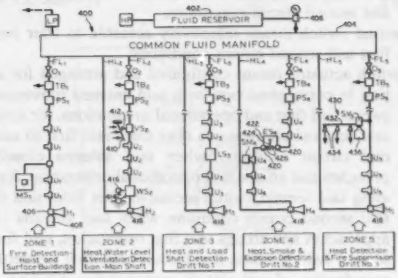
selector means adapted for receiving as selector input said sets of time slot signals, said selector means adapted for receiving as data input said data signals, said selector means being adapted for associating each of said data signals with a respective time slot, said selector means adapted for selecting and causing to be delivered to said audio output means a particular one of said audio signals during those of said time slots for which said respective data signals are high and for selecting and causing to be delivered to said audio output means the other of said audio signals during those of said time slots for which said respective data signals are low.

4,055,844

DETECTION SYSTEM

Lloyd H. Hornbostel, Jr., Beloit, Wis., assignor to Beloit Management & Research Center, Beloit, Wis.

Continuation-in-part of Ser. No. 368,609, June 11, 1973, abandoned. This application Apr. 19, 1974, Ser. No. 462,456
Int. Cl.² G08B *19/00*; A62C *37/24, 37/02*
U.S. Cl. 340—420 **13 Claims**



5. A static fluid system for detecting a change in ambient conditions comprising:

a closed elongate fluid line having an absolute fluid line pessure differing from the absolute ambient pressure of the line environment;

means coupled to said line to maintain said line pressure in said closed fluid line;

a plurality of means for sensing ambient conditions positioned in said line and adapted to normally maintain the fluid continuity and closed static fluid integrity of said line, at least one of said sensing means being responsive to a first selected change in the ambient conditions of the line environment and at least one other of said condition-sensing means being responsive to a second selected change in said line environment, said sensing means being operative to open said closed fluid line to a fluid flow at an initial flow rate which changes said line pressure to said ambient pressure; one of said sensing means comprising a ventilation monitoring system including a pressure-responsive valve coupled to said line and biased normally closed to maintain the fluid integrity of said line and air-flow detection means coupled with said valve, said air flow detection means being arranged to maintain said valve closed under selected normal air flow conditions in said line environment and further arranged to open said valve and change said line pressure to ambient pressure in response to a selected air flow change;

means coupled to said line for creating a signal in response to the change of said line pressure to ambient pressure, said signal creating means connected to signal activation means through connecting means separate from said fluid line; and

means for restricting fluid flow from said pressure maintaining means to said line both before and after the change of said line pressure, said flow restricting means having an effective flow area such that the fluid flow therethrough is substantially lower than said initial flow rate, said restricting means also being operative to permit fluid flow into said line to compensate for line leakage and to preclude the re-establishment of said line pressure when said line is opened by sensing means.

4,055,845

ANTENNA ERECTING SYSTEM

Ray C. Ladrick, 961 Lornaberry Lane, Columbus, Ohio 43213

Filed June 14, 1976, Ser. No. 696,033
Int. Cl.² H01Q *1/32, 3/00*
U.S. Cl. 343—715 **10 Claims**

1. An improved system for effecting the movement of a

communications antenna between a first and an operational orientation comprising:

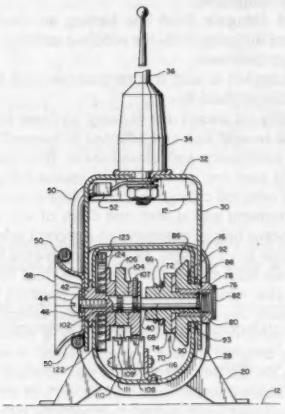
electric motor means including a winding energizable from a source and having a drive output;

drive means coupled for movement in driven relationship with said motor means drive output and in driving relationship with said antenna for selectively moving said antenna between said orientations;

first switch means selectively actuable to alter between first and second circuit conditions;

second switch means selectively actuable to alter between first and second circuit conditions;

switch actuator means configured and arranged for operation in correspondence with said antenna movement between said first and operational orientations, for actuating said first switch means to alter from said first to said second circuit condition when said antenna closely approaches and attains said operational orientation, for actuating said second switch means to alter from said first to said second circuit condition when said antenna closely approaches and attains said first orientation, said first and second switch means first circuit condition permitting an energization of said electric motor means winding,



double pole switch means connectable to convey power from said source, manually actuable to assume first and second circuit conditions and coupled for selective circuit completing relationships with said motor means winding through said first and second switch means, said double pole switch means being arranged for effecting conveyance, when in said first circuit condition, of current from said source to energize said winding in one polar sense through said first switch means when said first switch means is in said first circuit condition to effect movement of said antenna toward said operational orientation and, being arranged for effecting conveyance, when in said second circuit condition, of current from said source to energize said winding in another polar sense through said second switch means when said second switch means is in said first circuit condition to effect movement of said antenna toward said first orientation, and

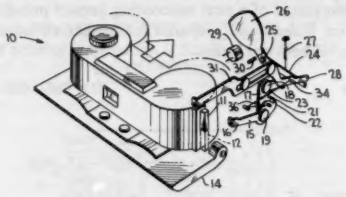
first status indicator means having a visually perceptible state when energized, and arranged for energization from said source through a circuit including said winding and said double pole switch means when in said first circuit condition and when said first switch means is in said second circuit condition.

4,055,846

FILM CARTRIDGE ANTI-TILTING ARRANGEMENT

Akira Yamanaka, Sakai, and Toshiaki Matsumoto, Toyoka-shi, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 30, 1976, Ser. No. 718,675
Claims priority, application Japan, Aug. 29, 1975, 50-105267
Int. Cl.[2] G03B *17/26, 7/00*
U.S. Cl. 354—21 **9 Claims**



1. A camera having a chamber open at one end for the reception of a film cartridge, a cover mounted on the camera for closing said open end of said chamber, an arrangement on said camera operable upon the closing of said cover for avoiding any tilting of the cartridge upon insertion thereof into said chamber and for controlling an exposure condition of the camera depending on the species of the film such as the film sensitivity contained within the cartridge which has on a side wall thereof a signal element of a selected size corresponding with the species of the film, said arrangement comprising:

a movable detecting member extending toward said open end;

spring means on the camera urging said detecting member for movement toward said open end;

an adjusting member mounted for movement together with said detecting member for controlling an exposure condition of the camera; and

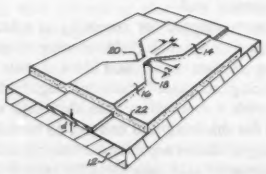
release means for actuating said detecting member for movement thereof against the force of said spring means away from said open end upon the closing of said cover, said release means including a release lever extending partly outwardly of said open end and being mounted for movement away from said open end upon the closing of said cover; whereby any tilting of the cartridge inserted within said chamber is avoided by the release of the force of said spring means acting against the signal element having a predetermined size causing it to bear againt said detecting member.

4,055,847

GERMANIUM COATED MICROBRIDGE AND METHOD

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Louis B. Holderman, Boyds, Md., and Palmer N. Peters, Huntsville, Ala.

Filed Aug. 13, 1976, Ser. No. 714,158
Int. Cl.[2] H01L *39/22, 27/12, 45/00*
U.S. Cl. 357—5 **9 Claims**



1. A microbridge device for use in a superconductive quantum interference device comprising:

a supporting substrate;

a first element of superconductive material carried on said substrate;

a second element of superconductive material carried on said substrate adjacent said first element defining a space therebetween;

connecting means bridging said space and connecting said first and second elements to establish an electrical weak link therebetween;

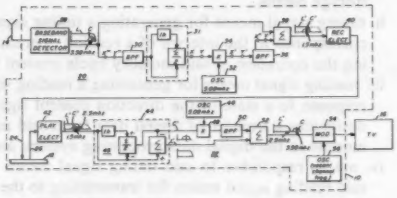
a coating of semiconductor material adjacent said first and second elements and said space electrically shunting said connecting means at room temperatures to prevent the destruction of said device by minute currents while acting as a dielectric permitting normal electrical behavior at cryogenic temperatures.

4,055,848

SIGNAL PROCESSING FOR OFF-AIR VIDEO RECORDER

William T. Fearnside, Fishers, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,100
Int. Cl.² H04N 5/76
U.S. Cl. 358—8 **10 Claims**



6. Apparatus for recording an NTSC-type television signal on a recording medium, said apparatus being adapted for use with playback apparatus having means for combing apart interleaved chroma and luminance signal information, and comprising:

a. means for isolating that part of the signal spectrum containing interleaved chroma and luminance signal information;

b. comb filter means for removing luminance signal information from said isolated signal spectrum part to produce an isolated signal spectrum part containing substantially only chroma signal information;

c. means in addition to said comb filter for reducing the vertical resolution of the chroma signal information;

d. means for shifting in frequency said isolated signal spectrum part containing substantially only chroma signal information so that it overlays and interleaves with, spectrum-wise, that part of the signal spectrum of the NTSC-type signal containing only luminance signal information; and

e. means for simultaneously applying said shifted chroma signal information, and the luminance signal information corresponding to that part of the signal spectrum of the NTSC-type signal containing only luminance signal information, to a common recording track of said recording medium,

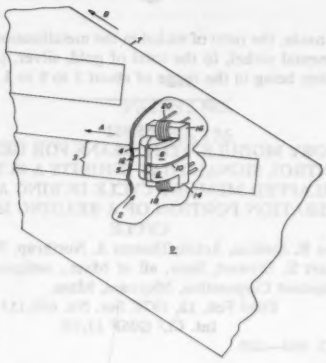
said means for reducing chroma vertical resolution being adapted to do so to reduce the bleeding of chroma signal information into the playback luminance signal channel during the combing apart of the shifted chroma signal information and said luminance signal information, thereby to mitigate horizontally travelling video artifacts.

4,055,849

MAGNETIC HEAD POSITIONING AND PLAYBACK APPARATUS UTILIZING A SPLIT HEAD FOR SELF-TRACKING AND SELECTIVE REPRODUCTION

William Kelsey Hickok, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 15, 1976, Ser. No. 677,100
Int. Cl.² G11B 5/26
U.S. Cl. 360—77 **2 Claims**



1. A magnetic head positioning and playback apparatus for use with a magnetic head having a playback gap for reproducing a signal from a magnetic track on a track bearing record carrier, the head comprising a first pole piece and a second pole piece, the pole pieces having end surfaces each defining and being separated by the playback gap, non-magnetic means dividing the first pole piece including its end surface into first and second portions such that the playback gap is correspondingly divided, magnetic means respectively coupling each of said first and second portions to the second of said pole pieces to form first and second magnetic circuits, the improvement wherein the positioning and playback apparatus further comprises:

electrical means coupled to each of said magnetic circuits simultaneously operative in a first mode for providing from the first and second magnetic circuits a tracking error signal having a component indicative of the magnitude and direction of the error in the position of the head relative to the magnetic track and in a second mode for providing a playback signal from the first and second magnetic circuits;

comparator means for monitoring said tracking error signal and for providing a switching signal when the value of said tracking error signal exceeds a predetermined level indicative of a disturbance in the magnetic track which is being predominantly reproduced by the first of the magnetic circuits; and

switching means responsive to said switching signal for cooperating with said electrical means operative in said second mode for providing an alternate playback signal from the second magnetic circuit, whereby said alternate playback signal is provided from that magnetic circuit which is not predominantly affected by the disturbance in the magnetic track.

4,055,850

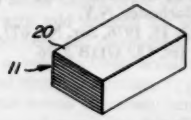
CAPACITOR WITH ELECTRODE CONTAINING NICKEL

Sri Prakash, Simpsonville, S.C., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 23, 1975, Ser. No. 643,755
Int. Cl.² H01G 1/01
U.S. Cl. 361—305 **2 Claims**

1. A dielectric substrate having thereon a metallization hav-

ing a metal constituent consisting of finely divided particles of at least one member selected from the group consisting of gold, silver, platinum, palladium and alloys thereof, and containing



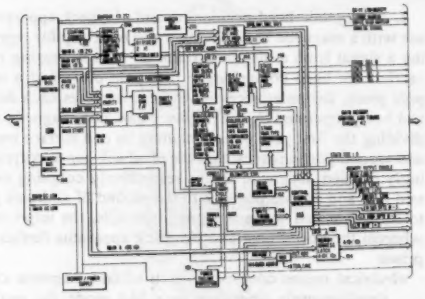
nickel oxide, the ratio of nickel in the metallization, calculated as elemental nickel, to the total of gold, silver, platinum and palladium being in the range of about 1 to 9 to 1 to 4.

4,055,851

MEMORY MODULE WITH MEANS FOR GENERATING A CONTROL SIGNAL THAT INHIBITS A SUBSEQUENT OVERLAPPED MEMORY CYCLE DURING A READING OPERATION PORTION OF A READING MEMORY CYCLE

Stephen R. Jenkins, Acton; Thomas A. Northrup, Westford, and Robert E. Stewart, Stow, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 13, 1976, Ser. No. 658,113
Int. Cl.[2] G06F *13/06*
U.S. Cl. 364—200 **5 Claims**



1. A random access memory module for connection over a bus to a digital data processing system that, for each of successive memory cycles including reading and writing memory cycles, initiates a data transfer by transmitting binary address signals and asynchronous control signals that include a starting control signal for initiating a data transfer with said memory module and a binary direction control signal for controlling the direction of the data transfer between said random access memory module and the digital data processing system, said random access memory module comprising:

A. addressable storage means for storing digital data in addressable storage locations therein,

B. address decoding means for producing an enabling signal when said address decoding means receives, from the digital data processing system, binary address signals that identify a said storage location in said addressable storage means, and

C. control means connected to said addressable storage means and said address decoding means, said control means including:

i. memory cycle control means responsive to the enabling signal and the starting control signal for producing a selected one of the reading and writing memory cycles, each said memory cycle including a reading operation during which digital data is retrieved from an identified one of said locations in said addressable storage means and a succeeding writing operation during which data is stored in said identified location in said addressable storage means,

ii. timing signal means for generating a timing signal that corresponds to the interval of a reading operation during the operation of said memory cycle control means,

iii. reading signal means for generating a reading signal in response to a state of the direction control signal that designates a transfer of digital data from said memory module to the digital data processing system, and

iv. means responsive to said timing signal means and to said reading signal means for transmitting to the digital data processing system a BUS OCCUPIED signal that is coterminous with the timing signal during a reading cycle, the BUS OCCUPIED signal inhibiting the initiation of any succesive memory cycles by the digital data processing system until the completion of a reading operation during a reading memory cycle and the termination of the BUS OCCUPIED signal.

DESIGN PATENTS

GRANTED OCTOBER 25, 1977

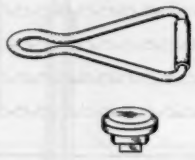
ERRATA

For CLASS	See PATENT NO.
015-032	246,176

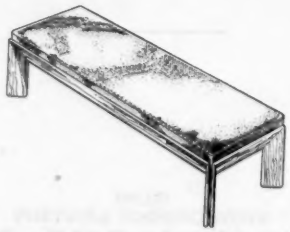
DESIGNS

OCTOBER 25, 1977

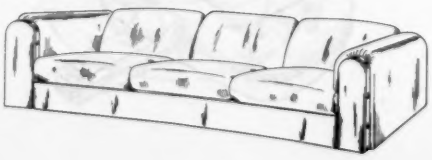
246,141
FASTENER
Harry E. Mazur, P.O. Box 4508, Palm Springs, Calif. 92262
Filed Jan. 6, 1975, Ser. No. 538,539
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—409



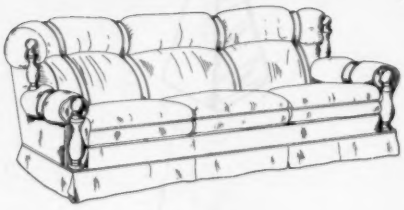
246,142
BENCH OR SIMILAR ARTICLE
Jules M. Heumann, South San Francisco, Calif., assignor to Metropolitan Furniture Manufacturing Company, South San Francisco, Calif.
Division of Ser. No. 595,564, July 14, 1975. This application Sept. 22, 1976, Ser. No. 725,661
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—58



246,143
SEAT
Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed June 11, 1976, Ser. No. 695,132
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



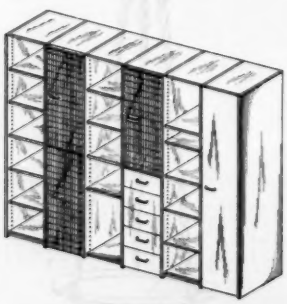
246,144
SEAT
Stanley P. Nash, Johnson Creek, Wis., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Filed June 11, 1976, Ser. No. 695,134
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



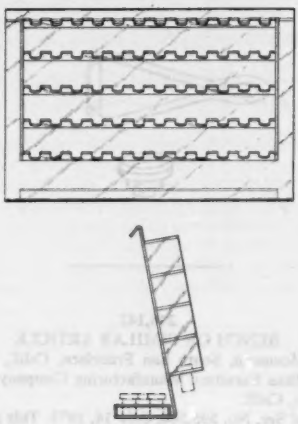
246,145
HANGING SUPPORT FOR ARTICLES
Lee Hendricks, 3445 W. 190th, Torrance, Calif. 90504
Filed Mar. 18, 1976, Ser. No. 667,887
Term of patent 7 years
Int. Cl. D6—*04;* D11—*02*
U.S. Cl. D6—113

246,146
CHEST OF DRAWERS
Robert K. S. Han, 999 Green St., No. 2701, San Francisco, Calif. 94133
Filed June 18, 1976, Ser. No. 697,343
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—145

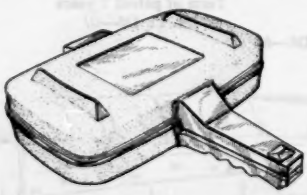
246,147
COMBINED MULTIPLE CABINET AND SHELF STORAGE UNIT
Walter Müller, 3 Eschenstrasse, 8603 Schwerzenbach, Switzerland
Filed May 27, 1976, Ser. No. 690,568
Claims priority, application Germany, Dec. 12, 1975, 849
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164



246,148
DISPENSING RACK FOR CONTACT LENS VIALS
Edwin F. Kusek, Arlington Heights, Ill., assignor to Wesley-Jessen Inc., Chicago, Ill.
Filed June 18, 1976, Ser. No. 697,522
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—188

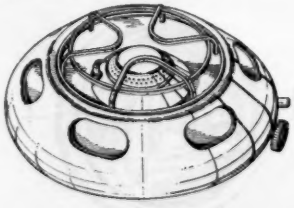


246,149
ELECTRIC FOOD COOKER
Monte L. Levin, New York, N.Y., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed May 17, 1976, Ser. No. 687,027
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—94



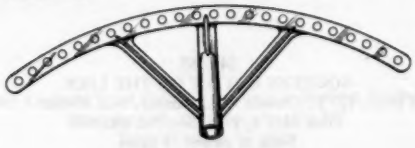
246,150
CITRUS FRUIT JUICE EXTRACTOR
Bisked U. Evangelista, 1363 Skyhawk Circle, Virginia Beach, Va. 23454
Filed Dec. 9, 1975, Ser. No. 639,071
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—48

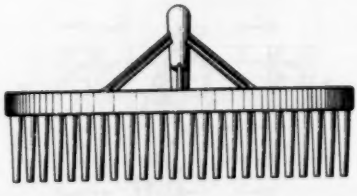
246,151
PORTABLE COOKING STOVE
Ming Kong Chan, 58 Pau Chung Street, Tokwawan, Kowloon, Hong Kong
Filed July 29, 1975, Ser. No. 600,047
Claims priority, application United Kingdom, May 20, 1975, 971137/75
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—110



246,152
ANCHORING DEVICE FOR PLANTS
Emil Thomas Luoma, 1555 Pleasant Hill, Lafayette, Calif. 94549
Filed Oct. 3, 1975, Ser. No. 619,445
Term of patent 14 years
Int. Cl. D11—*02;* D8—*08*
U.S. Cl. D8—1

246,153
CONTOURED GRADING RAKE
Charles J. Insalaco, Pigeon Swamp Road, South Windham, Conn. 06266
Filed Sept. 15, 1976, Ser. No. 723,663
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—13





246,154

COMBINED LETTER OPENER AND KEY HOLDER

Chak-Pui Tsang, No. 80, Bonham Road Block B1, 28th floor, Hong Kong

Filed Jan. 7, 1976, Ser. No. 647,324

Claims priority, application United Kingdom, July 16, 1975, 971843/75

Term of patent 14 years

Int. Cl. D3—*01*

U.S. Cl. D8—104

246,155

SQUEEZE BOTTLE OR THE LIKE

Earl Hoyt, 127 E. Cresent Ave., Ramsey, N.J. 07446

Filed May 4, 1976, Ser. No. 683,443

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—2

246,156

COMBINED BOTTLE AND CAP THEREFOR

Ralph A. Muscatiello, Norwood, and Kent M. Wright, Sudbury, both of Mass., assignors to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. D375,815, July 2, 1973. This application May 2, 1975, Ser. No. 574,020

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—71

246,157

END CLOSURE FOR A CONTAINER

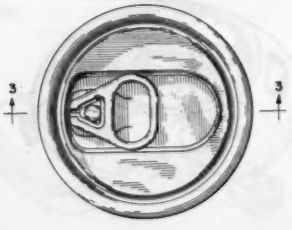
Max G. Kocour, Kenilworth, and Arthur P. Zundel, Mount Prospect, both of Ill., assignors to National Can Corporation, Chicago, Ill.

Filed Mar. 1, 1976, Ser. No. 662,364

Term of patent 14 years

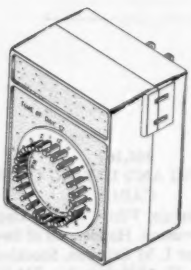
Int. Cl. D9—*07*

U.S. Cl. D9—255

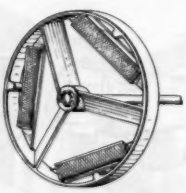


246,158
DIGITAL CLOCK
Andrew Durco, Jr., Dallas, Tex., assignor to Mostek Corporation, Carrollton, Tex.
Division of Ser. No. 441,264, Feb. 11, 1974. This application Mar. 1, 1976, Ser. No. 663,597
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

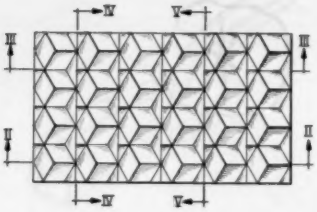
246,159
LIGHTING AND APPLIANCE TIMER
Robert Podall, Northbrook, Ill., assignor to AMF Incorporated, White Plains, N.Y.
Filed Oct. 6, 1975, Ser. No. 619,989
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40



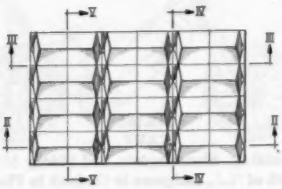
246,160
REFLECTOR
Robert A. Lattie, 2292 E. Claire, Phoenix, Ariz. 85020
Filed Mar. 22, 1976, Ser. No. 668,372
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111



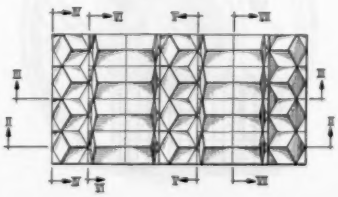
246,161
REFLECTOR
Henry Lindner, Wood Dale, Ill., assignor to Beatrice Foods Co.
Filed June 25, 1976, Ser. No. 699,943
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111



246,162
REFLECTOR
Henry Lindner, Wood Dale, Ill., assignor to Beatrice Foods Co.
Filed June 25, 1976, Ser. No. 699,944
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

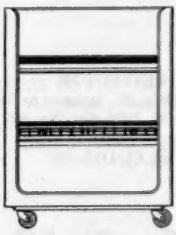


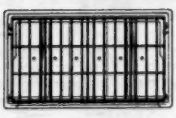
246,163
REFLECTOR
Henry Lindner, Wood Dale, Ill., assignor to Beatrice Foods Co.
Filed June 25, 1976, Ser. No. 699,945
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111



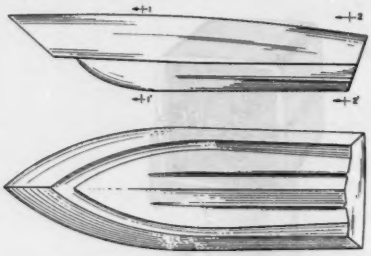
246,164
ELECTRONIC WATCH
Dale R. Koehler, Westwood, N.J., assignor to Bulova Watch Company, Inc., Flushing, N.Y.
Filed Sept. 5, 1975, Ser. No. 610,833
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—124

246,165
CART
Stephen A. Bacskay, Bloomingdale, and Sidney Messeri, West Orange, both of N.J., assignors to Outlook in Plastics Corporation, Inc. and Tingue, Brown & Co., part interest to each
Filed Nov. 17, 1976, Ser. No. 742,549
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—29

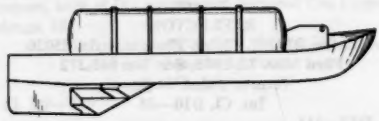




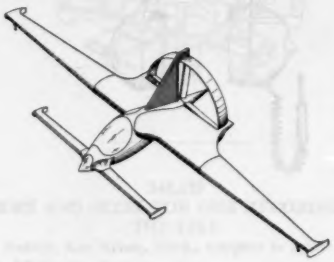
246,166
BOAT HULL
Robert P. Meek, P.O. Box 234C, Goleta, Calif. 93017
Continuation of Ser. No. 496,700, Aug. 12, 1974. This application Mar. 8, 1976, Ser. No. 665,162
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



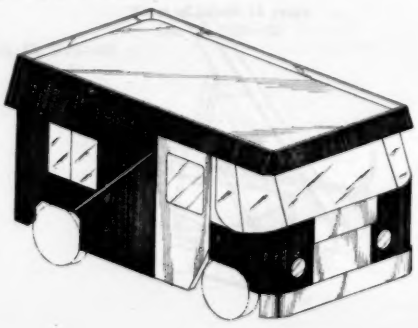
246,167
TOOL FOR DIGGING AND LAYING OF SUBMARINE CABLE
Stig Ture Carlsson, Spanga; Viktor Scuka, Upplands Balinge, and Bo Magnus Rasmusson, Handen, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Oct. 22, 1976, Ser. No. 734,803
Claims priority, application Sweden, May 3, 1976, 76-0964
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D12—65



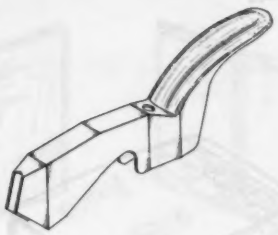
246,168
MAN POWERED AIRPLANE
Donald S. Landrus, 978 Kimball Drive, Reno, Nev. 89502
Filed May 17, 1976, Ser. No. 686,728
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—78



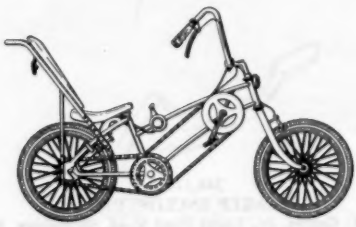
246,169
VENDING VEHICLE BODY FOR SELLING AND DISPENSING FROZEN DESERTS OR THE LIKE
Gary Spencer, 518 Lake View Terrace, Webster, N.Y. 14580
Filed June 21, 1974, Ser. No. 481,658
Term of patent 3½ years
Int. Cl. D12—*08*
U.S. Cl. D12—99



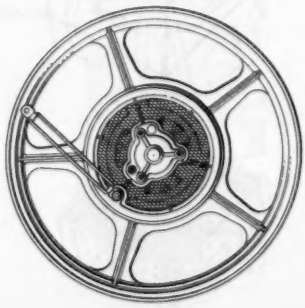
246,170
BICYCLE COWLING
Michael E. Powers, 910 Hampton Road, Arcadia, Calif. 91006
Filed Apr. 12, 1976, Ser. No. 675,982
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111



246,171
BICYCLE
Jackie L. Dodd, Rte. 4, Drew Road, Cumming, Ga. 30130
Filed June 7, 1976, Ser. No. 693,478
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111

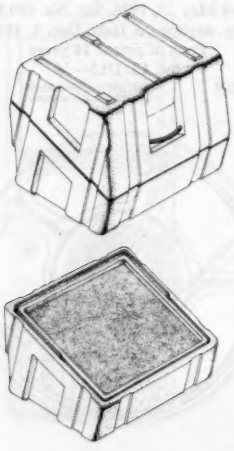


246,172
WHEEL FOR MOTOR-CYCLES
Tullio Campagnolo, Corso Padova, 168, Vicenza 36100, Italy
Filed May 25, 1976, Ser. No. 689,838
Claims priority, application Italy, Dec. 1, 1975, 22800/75
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205



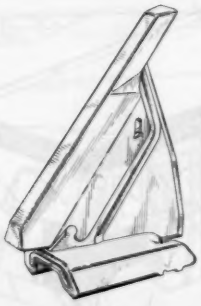
246,173
CONTROL UNIT FOR ELECTRONIC NEURAL STIMULATOR
Kenneth M. Levin, 51 Cornell Ave., Larkspur, Calif. 94939
Filed Jan. 19, 1976, Ser. No. 650,209
Term of patent 14 years
Int. Cl. D13—*03;* D24—*02*
U.S. Cl. D13—32

246,174
SPEAKER ENCLOSURES
Timothy L. Griffin, Jr., Locks Pond Road, Shutesbury, Mass. 01072
Filed Oct. 7, 1976, Ser. No. 730,693
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—33

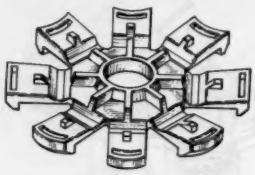


246,175
HEADPHONE APPARATUS
Gary Adam Stubelick, 791 Tremont St., Studio E316, Boston, Mass. 02118
Filed Jan. 12, 1976, Ser. No. 648,461
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—36

246,176
ADAPTER FOR CORNER SHAPED TOOTH FOR EXCAVATING, DIGGING OR BUCKET LOADING EQUIPMENT
Sten Johan Dahlberg, Karlskoga; Jouko Kalevi Korpi, Degerfors, both of Sweden, and Ulf Robert Larsson, Brampton, Canada, assignors to AB Bofors, Bofors, Sweden
Filed Dec. 15, 1975, Ser. No. 640,989
Claims priority, application Sweden, June 19, 1975, 751270
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—32

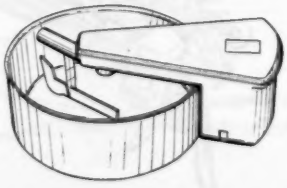


246,177
DISK CLAMPING ELEMENT
Warren L. Dalziel, Monte Sereno, Calif., assignor to Shugart Associates, Sunnyvale, Calif.
Filed Mar. 10, 1976, Ser. No. 665,710
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40

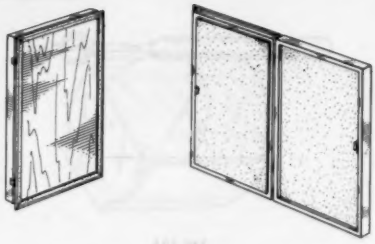


246,178
CLOSURE AND BEZEL FOR DISK RECORDERS AND THE LIKE
Otto R. Butsch, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.
Filed Dec. 12, 1975, Ser. No. 640,047
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—40

246,179
ELECTRIC ICE-CREAM FREEZER
Andre Faivre, Dijon, France, assignor to S E B, Selongey, France
Continuation-in-part of Ser. No. 577,887, May 15, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,126
Claims priority, application France, Nov. 15, 1974, 74.100; Apr. 30, 1976, 76.130
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—82

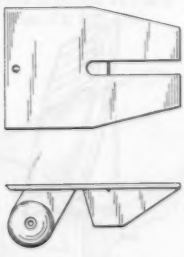


246,180
CABINET BULLETIN BOARD
Loretta H. Yamauchi, 18943 San Antonio St., Fountain Valley, Calif. 92708
Filed Dec. 11, 1975, Ser. No. 639,984
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—52



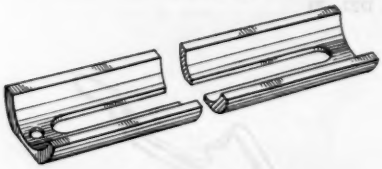
246,181
FISHING ROD HANDLE
Thomas E. Sweeney, 52 Main St., Kingston, N.J. 08528
Filed July 28, 1976, Ser. No. 709,538
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23

246,182
DIVING SINKER
Joseph F. Neary, Novato, Calif., assignor to Troller Corporation, Sausalito, Calif.
Filed Nov. 10, 1976, Ser. No. 740,512
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—30



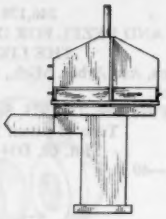
246,183
SPRINKLER STANDARD
Robert Donald Keen, 20601 Skouras Drive, Canoga Park, Calif. 91306
Filed Mar. 29, 1976, Ser. No. 671,345
Term of patent 7 years
Int. Cl. D23—*01*
U.S. Cl. D23—7

246,184
BOAT FOR CARRYING ARTICLES INTO AND OUT OF FURNACES
John Kudla, Colonia, N.J., assignor to Codi Corporation, Fair Lawn, N.J.
Filed Mar. 26, 1976, Ser. No. 670,667
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



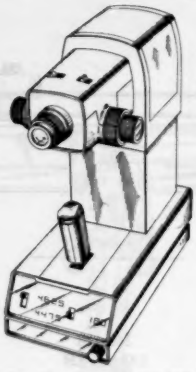
246,185
AIR FRESHENER OR THE LIKE
Francis Edward Husband Bradburne, Carlinghurst Road, Blackburn, Lancashire, England
Filed Oct. 18, 1976, Ser. No. 733,451
Claims priority, application United Kingdom, Apr. 21, 1976, 975382/76
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

246,186
OPHTHALMIC SUPPORT STAND
Dale A. Rorabaugh, San Diego, Calif., assignor to Surgical Mechanical Research, Inc., Newport Beach, Calif.
Filed Sept. 2, 1976, Ser. No. 719,792
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1.1



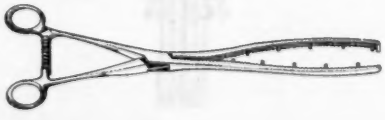
246,187
DOUBLE SYRINGE
Samuel W. DeArment, 3516 Arapahoe, Fort Collins, Colo. 80521
Filed Nov. 10, 1975, Ser. No. 630,436
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—14

246,188
OPHTHALMOMETER OR SIMILAR ARTICLE
Paul A. Jordan, Fairport, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Sept. 13, 1976, Ser. No. 722,984
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

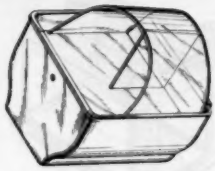


246,189
ELECTROAURICULAR THERAPY PROBE
Harold E. Smith, 7120 NW. Overlook Drive, Vancouver, Wash. 98665
Filed Sept. 24, 1975, Ser. No. 616,188
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

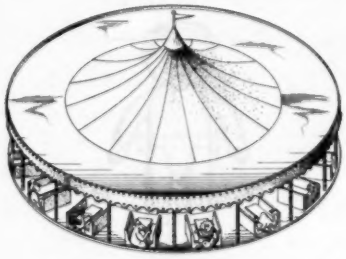
246,190
HEPATIC OCCLUSION CLAMP
Joseph Hodge, Spartanburg, S.C., assignor to Pilling Co., Fort Washington, Pa.
Filed Feb. 26, 1976, Ser. No. 661,628
Term of patent 14 years
Int. Cl. D24—*02*; D8—*02*
U.S. Cl. D24—27



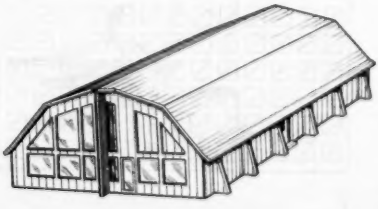
246,191
SWAB DISPENSER
John A. Russo, Westport; David E. Ham, Stamford, both of Conn., and Jean Pierre Vitrac, Paris, France, assignors to Chesebrough-Pond's Inc., Greenwich, Conn.
Filed Dec. 2, 1975, Ser. No. 637,033
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—33



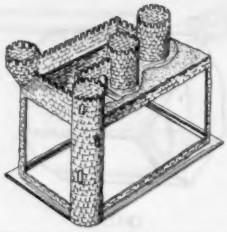
246,192
BUILDING FOR DISPENSING ICE CREAM
Harold D. Albright, Jr., 2201 Providence Road, Charlotte, N.C. 28211
Filed July 12, 1976, Ser. No. 704,239
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—9



246,193
BUILDING
Sandra Lee Reckwald, 1145 Valley Road, Mackinaw City, Mich. 49701
Filed Sept. 2, 1976, Ser. No. 719,921
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—24

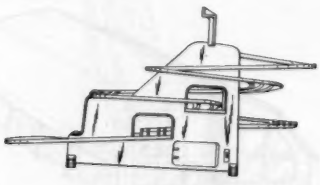


246,194
AQUARIUM COVER
Scott P. Akers, 1515 Fort Davis Place, SE., Washington, D.C. 20021
Filed Sept. 28, 1976, Ser. No. 727,601
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—12

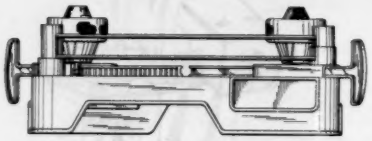


246,195
BOY DOLL
Adolph L. Goldfarb, Tarzana; Erwin Benkoe, Encino; Delmar K. Everitt, Woodland Hills; Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, all of Calif., assignors to Adolph E. Goldfarb and Erwin Benkoe
Filed Jan. 23, 1976, Ser. No. 651,720
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

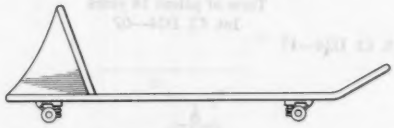
246,196
TOY RACING TRACKWAY
Toshio Suzuki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Nov. 5, 1975, Ser. No. 628,946
Claims priority, application Japan, June 3, 1975, 50-22156
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CC



246,197
STYLIZED BOXING GAME APPARATUS, OR SIMILAR ARTICLE
Tetsuo Iwanami, Matsudo, Japan, assignor to Sanyei Corporation, Nagoya, Japan
Filed July 24, 1975, Ser. No. 598,776
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AD



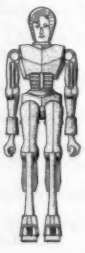
246,198
COASTER
Douglas H. Rose, 1725 Via De Alba, Rancho Santa Fe, Calif. 92067
Filed Apr. 13, 1976, Ser. No. 676,693
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



246,199
ARTICULATED TOY FIGURE
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 17, 1976, Ser. No. 686,735
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AD

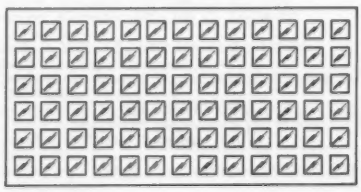
246,200
ARTICULATED TOY FIGURE
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 17, 1976, Ser. No. 686,786
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AD

246,201
ARTICULATED TOY FIGURE
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 17, 1976, Ser. No. 686,960
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AD



246,202
ANIMATION LAMP
Henry J. Oppermann, 617 Westland Drive, Greensburg, Pa. 15601
Filed June 17, 1975, Ser. No. 587,710
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

246,203
LIGHTING PANEL
Edward H. Harris, 1065 E. Flamingo Road, Apt. 524, Las Vegas, Nev. 89109
Filed Apr. 26, 1976, Ser. No. 680,585
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R

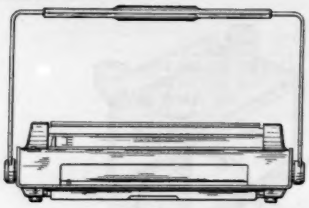


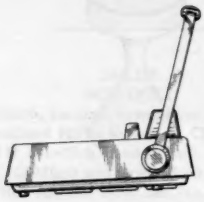
246,204

BOOK BINDING MACHINE

James G. Balmer, Bloomfield Hills, and Peter E. Linder, Southfield, both of Mich., assignors to Velo-Bind, Inc., Sunnyvale, Calif.

Filed Oct. 28, 1975, Ser. No. 626,287
Term of patent 14 years
Int. Cl. D18—*04*
U.S. Cl. D64—11 R





246,205

COMBINED WALLET AND CALCULATOR

Peter Howard Lewis, 12A Turtle Cove Villas, Redhill Road, Tai Tam, Hong Kong

Filed Sept. 16, 1975, Ser. No. 613,863
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 A

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TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF OCTOBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.C.I. Operations Pty. Ltd.: *See*—
Hammond, Michael George Ridler, 4,055,032, Cl. 53-14.000.

A. Christiaens Societe Anonyme: *See*—
Delarge, Jacques E.; Lapiere, Charles L.; and Georges, Andre H., 4,055,650, Cl. 424-263.000.

A. H. Emery Company, The: *See*—
Brackett, George E., 4,055,227, Cl. 177-208.000.

A. J. Gerrard & Company: *See*—
Simich, Emil; and Traxinger, Walter R., 4,055,115, Cl. 100-34.000.
Simich, Emil, 4,055,328, Cl. 254-79.000.

AAI Corporation: *See*—
Sweeney, Patrick E., 4,055,332, Cl. 266-48.000.

Aasgaard, Alvin L. P., III: *See*—
Kamp, Walter B.; Kimmel, Richard L.; and Aasgaard, Alvin L. P., III, 4,054,993, Cl. 30-276.000.

AB Svenska Flaktfabriken: *See*—
Larkfeldt, Birger, 4,055,112, Cl. 98-33.00A.

AB Ziristor: *See*—
Sjostrand, Uno Roland; and Johansson, Goran Karl Nils, 4,055,035, Cl. 53-167.000.

Abbott Laboratories: *See*—
Tomioka, Shinji; Mori, Yasuki; Nara, Takashi; and Shirahata, Kunikatsu, 4,055,715, Cl. 536-17.000.

Abbott, Phillip Andrew, to Brown & Root, Inc. Deck section loading. 4,055,264, Cl. 214-152.000.

Abe, Naohiro: *See*—
Fujikura, Masakuni; and Abe, Naohiro, 4,055,448, Cl. 148-38.000.

Abel, Heinz: *See*—
Schafer, Paul; Abel, Heinz; and Mayer, Fritz, 4,055,393, Cl. 8-62.000.

Aberg, Martin Birger. Safety device for gear wheels. 4,055,092, Cl. 74-439.000.

Abraham, Robert C.; and Cline, James E. D., to Pertec Computer Corporation. Phase locked loop for synchronizing VCO with digital data pulses. 4,055,814, Cl. 331-1.00A.

Abrahams, Siegfried: *See*—
Berlin, Herbert; Abrahams, Siegfried; and Brand, Peter, 4,055,192, Cl. 131-84.00B.

ACF Industries, Incorporated: *See*—
Freeman, John W.; Jones, Thomas M.; and Reagan, Harold D., 4,054,978, Cl. 29-157.10R.
Vyvial, Larry A., 4,055,325, Cl. 251-328.000.

Ackeret, Peter, to Salter Housewares Limited. Food comminuting device. 4,055,308, Cl. 241-100.000.

Ackrell, Jack; and Muchowski, Joseph M., to Syntex (U.S.A.) Inc. 6,11-Dihydrodibenzo-[b.e.]-thiepin-11-one-3-thioacetates. 4,055,574, Cl. 260-327.00B.

Adachi, Keiichi: *See*—
Masuda, Takao; and Adachi, Keiichi, 4,055,432, Cl. 96-114.100.

Adamson, Arthur P.; Sargisson, Donald F.; and Stotler, Charles L., Jr., to United States of America, National Aeronautics and Space Administration. Integrated gas turbine engine-nacelle. 4,055,041, Cl. 60-226.00R.

Addressograph Multigraph Corporation: *See*—
Baltazzi, Evan Serge; and Datta, Pabitra, 4,055,684, Cl. 427-18.000.

Aeberli, Max, to Sandoz Ltd. Monoazo and disazo compounds having optionally further substituted 2-acyl-, carboxy- or cyano-benzothienyl diazo component radicals. 4,055,556, Cl. 260-152.000.

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Heumann, Heinz; Saure, Manfred; Wagner, Heinz; and Wartusch, Johann, 4,055,504, Cl. 252-63.200.

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Movshovich, Pavel Mikhailovich; Maximov, Gennady Konstantinovich; Khavkin, Viktor Pavlovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Afanasiev, Vladimir Konstantinovich; Kudryavtseva, Tamara Nikolaevna; and Nezelenov, Sergei Vladimirovich, 4,055,039, Cl. 57-34.0AT.

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Bayer, Gunther; Fitzky, Hans Georg; Hoyer, Herbert; Luttgens, Gunter; and Muller-Bardorff, Wolfgang, 4,055,685, Cl. 96-87.00R.
Bergthaller, Peter; Himmelmann, Wolfgang; Sauerteig, Wolfgang; and Rosenhahn, Lothar, 4,055,427, Cl. 96-67.000.
Feneberg, Paul; and Krekeler, Ulrich, 4,055,378, Cl. 351-160.000.
Kaiser, Michael; and Schaffer, Ludwig, 4,055,289, Cl. 226-92.000.

Aharoni, Shaul M.: *See*—
Prevorsek, Dusan C.; and Aharoni, Shaul M., 4,055,606, Cl. 260-835.000.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Current scaling apparatus. 4,055,774, Cl. 307-296.00R.

Airway Industries, Inc.: *See*—
Weiner, Jay H., 4,055,239, Cl. 190-50.000.

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Numazawa, Akio; Nakamura, Hiroyuki; Kurita, Tokio; Horie, Kouji; and Kondo, Toshio, 4,055,237, Cl. 188-73.400.

Akae Kikai Kogyo Co., Ltd.: *See*—
Moori, Takuo, 4,055,487, Cl. 209-44.000.

Akamatsu, Takashi: *See*—
Hotta, Seiji; and Akamatsu, Takashi, 4,055,565, Cl. 260-281.00N.

Akimov, Jury Stepanovich; Sushkov, Valery Petrovich; and Kurinny, Vladimir Ivanovich. Method for producing semiconductor matrix of light-emitting elements utilizing ion implantation and diffusion heating. 4,055,443, Cl. 148-1.500.

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Ishida, Torao; Shirai, Takashi; and Akiyama, Minoru, 4,055,716, Cl. 536-23.000.

Akrosil Corporation: *See*—
Kapral, Ales M., 4,055,613, Cl. 264-46.400.

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Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,055,638, Cl. 424-219.000.

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Borjesson, Anders, 4,054,990, Cl. 29-623.100.

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Friedman, Stephen B.; and Linnecke, Carl B., 4,055,394, Cl. 23-253.0TP.
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Bauer, James J.; Albright, Larry E.; Werner, James L.; Sagaser, Thomas M.; and Hoechst, Lonnie D., 4,055,262, Cl. 214-140.000.

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Sivilotti, Olivo Giuseppe, 4,055,474, Cl. 204-70.000.

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Goodenough, David John; Weaver, Kenneth E.; Smrcka, Joseph G.; and Clayman, William, 4,055,771, Cl. 250-505.000.

Aleniusson, Sven Goran, to Isolerings Aktiebolaget Isenta. Method for the application of a protection cover around heat or cool insulated tube bends. 4,054,985, Cl. 29-416.000.

Alger, Donald L.: *See*—
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Allan, Thomas T.; and Wilcox, David E., to Flanders Filters, Inc. Method and apparatus for the leak testing of filters. 4,055,075, Cl. 73-40.700.

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Martin, Jack P.; and Gray, Thomas H., 4,055,062, Cl. 72-47.000.

Allemand, Robert, to Commissariat a l'Energie Atomique. Detection apparatus for X-ray tomography. 4,055,767, Cl. 250-385.000.

Allied Chemical Corporation: *See*—
Murphy, Kevin P.; and Stahl, Richard F., 4,055,049, Cl. 60-651.000.
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Allinquant, Fernand Michel; and Allinquant, Jacques Gabriel. Sealing means for a longitudinally displaceable rod. 4,055,352, Cl. 277-152.000.

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Allinquant, Fernand Michel; and Allinquant, Jacques Gabriel, 4,055,352, Cl. 277-152.000.

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Kleen, Gerhard; Schiemann, Heinz; and Allmendinger, Karl, 4,055,825, Cl. 336-70.000.

Allori, Raymond J.: *See*—
Kestian, Anthony M.; and Allori, Raymond J., 4,055,230, Cl. 180-89.100.

Alpha Industries, Inc.: *See*—
Borzym, Alexander, 4,055,096, Cl. 83-37.000.
Borzym, Alexander, 4,055,100, Cl. 83-454.000.

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Stephens, Wilbur E., 4,055,334, Cl. 266-138.000.

Aluminum Company of America: *See*—
Kronenwetter, Howard W.; and Schultz, Freddy R., 4,055,271, Cl. 220-64.000.

Alvarez, Francisco S.; and Van Horn, Albert R., to Syntex (U.S.A.) Inc. Novel prostaglandin intermediates and process for the production thereof. 4,055,564, Cl. 542-413.000.

Alza Corporation: *See*—
Weinshenker, Ned M.; and Andersen, Niels H., 4,055,593, Cl. 260-514.00D.

Amabili, Arnaldo. Combination crown twist-off closure capp. 4,055,266, Cl. 215-252.000.

Amagami, Keizo: *See*—
Nakamura, Masatatsu; Kominami, Hideyuki; Amagami, Keizo; Kobayashi, Takao; and Toyooka, Tadao, 4,055,740, Cl. 219-10.49R.

Amatsu, Hideo: *See*—
Tozawa, Keizaburo; Amatsu, Hideo; Takahashi, Shinichiro; Fujimoto, Kazumi; and Ikeda, Kishio, 4,055,372, Cl. 312-15.000.

American Can Company: *See*—
Beese, Ronald E., 4,055,272, Cl. 220-64.000.

American Filtrona Corporation: *See*—
Holden, Herbert K.; and Mansfield, Peter W., 4,055,108, Cl. 93-1.00C.

American Home Products Corporation: *See*—
Chai, Sie-Yearl; and Yardley, John P., 4,055,553, Cl. 260-112.50S.

American Optical Corporation: *See*—
Winthrop, John Talley, 4,055,379, Cl. 351-171.000.

American Sterilizer Company: *See*—
Vig, Satinder K.; Koester, Harold J.; and Berg, William H., Jr., 4,054,965, Cl. 16-35.00D.
Waldron, Stephen H., 4,055,185, Cl. 128-305.100.

AMF Incorporated: *See*—
Ross, Haldon, 4,055,093, Cl. 74-501.00R.

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Bengtsson, Robert J., 4,055,320, Cl. 248-501.000.

Andersen, Erik, to Danfoss A/S. Electromagnetic valve assembly means. 4,055,823, Cl. 335-255.000.

Andersen, Niels H.: *See*—
Weinshenker, Ned M.; and Andersen, Niels H., 4,055,593, Cl. 260-514.00D.

Andresen, Peter B.; Winter, Claus; and Hendel, Siegfried H., to Inbauproduct Innenausbausysteme GmbH & Co., KG. Furniture construction system. 4,055,373, Cl. 312-263.000.

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Nott, Alan J., 4,055,485, Cl. 209-3.000.

Angner, Ronald Joseph; and Lacy, James Volney, to Bell Telephone Laboratories, Incorporated. Key telephone lamp control circuit. 4,055,731, Cl. 179-99.000.

Anselment, Wolfgang; and Gritschmeier, Walter, to Robert Bosch G.m.b.H. Lubricating powder and method of producing same and relatively slideable components. 4,055,503, Cl. 252-12.000.

Antkiw, Stephen, to Schlumberger Technology Corporation. Neutron characteristic and spectroscopy logging methods and apparatus. 4,055,763, Cl. 250-270.000.

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Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Takamatsu, Akira; Inui, Taiji; Tone, Hiroshi; and Morishima, Hajime, 4,055,468, Cl. 195-29.000.

Applied Power, Inc.: *See*—
Bayorgeon, Jeffrey T.; Vandalen, Dirk J.; and Legrand, Pierre N., 4,055,061, Cl. 72-32.000.

Ardezzone, Frank J., to Probe Rite, Inc. Multi-point test probe. 4,055,805, Cl. 324-158.00P.

Arizona Chemical Company: *See*—
Schluenz, Robert William; and Davis, Curry Beach, 4,055,576, Cl. 260-346.600.

Armour Pharmaceutical Company: *See*—
Colescott, Robert L.; Kaiser, Emil; Bossinger, Charles D.; and Cook, Paul I., 4,055,524, Cl. 260-8.000.
Skibbe, Martin O., 4,055,664, Cl. 424-330.000.

Armstrong Cork Company: *See*—
Dieck, Ronald L.; and Quinn, Edwin J., 4,055,520, Cl. 260-2.50R.
Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., 4,055,523, Cl. 260-2.50R.
Dieck, Ronald L.; and Quinn, Edwin J., 4,055,545, Cl. 260-47.00P.

Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, to Snam Progetti S.p.A. Process for producing stabilized olefin terpolymers and stabilized olefin terpolymers produced according to said process. 4,055,535, Cl. 260-45.70R.

Arya, Vishwa Prakash; and Nagarajan, Kuppuswamy, to Ciba-Geigy Corporation. Condensed pyrrole mercapto compounds having hypotensive and decongestant properties. 4,055,647, Cl. 424-251.000.

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Ishida, Torao; Shirai, Takashi; and Akiyama, Minoru, 4,055,716, Cl. 536-23.000.
Yano, Nobumitsu; Fukinbara, Itaru; Yoshida, Koji; and Korenaga, Tokiyoshi, 4,055,674, Cl. 426-430.000.

Ascher, Gerd; and Reinshagen, Hellmuth, to Sandoz Ltd. 1-(5-Nitrothiazolyl-2)-3-(piperazinomethyl)-imidazolidinones-2 and corresponding imino and thiones. 4,055,646, Cl. 424-250.000.

Ashida, Kaneyoshi; Ohtani, Masaaki; Yokoyama, Takashi; and Ohkubo, Shoichi, to Mitsubishi Chemical Industries Ltd. Process for producing an isocyanate-based polymer having reduced smoke generation. 4,055,522, Cl. 260-2.5AW.

Ashland Oil, Inc.: *See*—
Kim, Young D., 4,055,528, Cl. 260-29.300.

Atlantic Richfield Company: *See*—
McCoy, John J.; and Zajacek, John G., 4,055,630, Cl. 423-509.000.
Rosenthal, Rudolph; and Shawl, Edward T., 4,055,629, Cl. 423-509.000.

Atomic Energy of Canada Limited: *See*—
Pauluis, Gerard J.; and Miller, Alistair I., 4,055,398, Cl. 23-270.50W.

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Wada, Shigetaka; and Atsumi, Senji, 4,055,438, Cl. 106-73.320.

Auberger, Jacques: *See*—
Lucas, Roger; and Auberger, Jacques, 4,055,068, Cl. 72-356.000.

Auerbach, Albert A.; Katz, George M.; and Steinberg, Sidney, to Medalert Corporation. Condition monitoring pacer. 4,055,189, Cl. 128-419.0PG.

Augustin, Hans-Georg: *See*—
Ewald, Nis-Friedrich; and Augustin, Hans-Georg, 4,054,976, Cl. 29-90.00R.

Automatic Liquid Packaging, Inc.: *See*—
Komendowski, Henry, 4,055,282, Cl. 222-421.000.

Automation Industries, Inc.: *See*—
Yoli, Alfred H.; and Husain, Igbal, 4,055,508, Cl. 252-301.10W.

Automation Systems, Inc.: *See*—
Bartlett, Peter G., 4,055,793, Cl. 323-22.0SC.

B. F. Goodrich Company, The: *See*—
Chasar, Dwight William, 4,055,540, Cl. 260-45.95C.
Kroenke, William Joseph, 4,055,537, Cl. 260-45.75D.
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Riew, Changkiu Keith, 4,055,541, Cl. 260-47.0EN.

Babler, Fridolin; Mollet, Hans; and Zwahlen, Gunther, to Ciba-Geigy Corporation. Process for the manufacture of dustless, readily dispersible pigment granules. 4,055,439, Cl. 106-288.00Q.

Babushkina, Natalya Borisovna: *See*—
Movshovich, Pavel Mikhailovich; Maximov, Gennady Konstantinovich; Khavkin, Viktor Pavlovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Afanasiev, Vladimir Konstantinovich; Kudryavtseva, Tamara Nikolaevna; and Nezelenov, Sergei Vladimirovich, 4,055,039, Cl. 57-34.0AT.

Badertscher, Ernest; Chaveron, Michel; and Wenner, Valentin, to Societe d'Assistance Technique pour Produits Nestle S.A. Solubilization of casein. 4,055,555, Cl. 260-119.000.

Baermann, Max. Switchable permanent magnetic holding devices. 4,055,824, Cl. 335-288.000.

Baggett, Joseph McClendon, to Dow Chemical Company, The. Process for making polycarbonates using ammonia or ammonia compounds as the catalysts. 4,055,544, Cl. 260-47.0XA.

Bahr, William J. Adjustable hair-clipping devices. 4,054,991, Cl. 30-231.000.

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Erickson, Randall L.; and Bailey, Terry R., 4,055,377, Cl. 350-105.000.

Baker, David Clarkston; and Haskell, Theodore Herbert, to Parke, Davis & Company. 9-(3-O-Acyl-β-D-arabinofuranosyl)adenine compounds, 9-(2,3-di-O-acyl-β-D-arabinofuranosyl)-adenine compounds, and method for their production. 4,055,717, Cl. 536-26.000.

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Baker, Richard E.; and Baker, Elizabeth F. Vibrating strap. 4,055,169, Cl. 128-32.000.

Bakhanova, Lia Nakhshonovna: *See*—
Gvelesiani, Konstantin Shalvovich; Kadzhelashvili, Zauri Mikhailovich; Tskvitinidze, Alexandr Shalvovich; Tusishvili, Otari Shalvovich; Sherezadashvili, Andrei Illarionovich; Khabuliani, Gamlet Varlamovich; Bakhanova, Lia Nakhshonovna; and Tatishvili, Otari Vardenovich, 4,055,315, Cl. 243-33.000.

Balaguer, Rodolfo Rodriguez. Food cooking oven. 4,055,745, Cl. 219-406.000.

Balaz, Alexander; Bone, David P.; and Shannon, Edward L., to Quaker Oats Company, The. Method of making a dry-type pet food. 4,055,681, Cl. 426-656.000.

Balcke-Durr Aktiengesellschaft: *See*—
Krips, Herbert; and Podhorsky, Miroslav, 4,055,063, Cl. 72-62.000.

Ball, Charles E.: *See*—
Ball, Dorothy P.; and Ball, Charles E., 4,054,984, Cl. 29-237.000.

Ball, Dorothy P.; and Ball, Charles E. Tool for joining and separating plastic pipe joints. 4,054,984, Cl. 29-237.000.

Ballas, George C.; and Geist, Thomas N., to Weed Eater, Inc. Rotary cutting assembly. 4,054,992, Cl. 30-276.000.

Baltazzi, Evan Serge; and Datta, Pabitra, to Addressograph Multigraph Corporation. Coated carrier particles for use in electrophotographic process. 4,055,684, Cl. 427-18.000.

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Kawai, Shichio; Tanaka, Takaho; Bannai, Eisuke; Uchida, Kenji; and Shimizu, Ryuichi, 4,055,780, Cl. 313-346.00R.

Barber, Womack Hardy, Jr. Lamp fixture conversion method. 4,055,374, Cl. 316-2.000.

Barer, Sol J.; Valenti, Peter C.; and Marchwinski, Michael, to National Patent Development Corporation. Halogenated acylamino acids as fungicides. 4,055,663, Cl. 424-319.000.

Barry-Wehmiller Company: *See*—
Klamm, Robert L.; and Day, Maurice R., 4,055,252, Cl. 209-74.00M.

Barthel, Alfred, to Union Carbide Corporation. Cryogenic storage container. 4,055,268, Cl. 220-9.00C.

Bartlett, Peter G., to Automation Systems, Inc. Electrical load controller. 4,055,793, Cl. 323-22.0SC.

Bartley, William W., to Wean United, Inc. Apparatus for removing fluid in a piston cylinder assembly. 4,055,107, Cl. 92-86.500.

Bartolini, Robert Alfred; and Bloom, Allen, to RCA Corporation. Organic medium for thin-phase holography. 4,055,423, Cl. 96-27.00H.

BASF Aktiengesellschaft: *See*—
Patsch, Manfred; and Vamvakaris, Christos, 4,055,568, Cl. 260-302.00H.

Bates, Richard L.: *See—*
D'Antonio, Nicholas F.; Bates, Richard L.; and French, Richard W., 4,055,078, Cl. 73-88.50R.

Battelle Memorial Institute: *See—*
Stambaugh, Edgel P.; and Sachsel, George F., 4,055,400, Cl. 44-1.00R.

Battersby, John; Forbes, Eric Simon; and Reid, Angus Joseph Dickson, to British Petroleum Company Limited, The. Gasoline composition. 4,055,402, Cl. 44-58.000.

Bauer, James J.; Albright, Larry E.; Werner, James L.; Sagaser, Thomas M.; and Hoechst, Lonnie D., to Clark Equipment Company. Loader main frame for skid steer loader. 4,055,262, Cl. 214-140.000.

Bauer, Werner R., to Robertshaw Controls Company. Condition responsive control device. 4,055,828, Cl. 337-308.000.

Bayer Aktiengesellschaft: *See—*
Goebel, Hermann, 4,055,558, Cl. 260-166.000.
Hoffmann, Hellmut; Hammann, Ingeborg; and Stendel, Wilhelm, 4,055,571, Cl. 260-308.00R.
Hucks, Uwe; and Vernaleken, Hugo, 4,055,611, Cl. 264-6.000.
Niederprum, Hans; Klein, Heinz Gunter; and Meussdoerffer, Johann-Nikolaus, 4,055,458, Cl. 156-663.000.
Wiesel, Manfred; and Sommer, Richard, 4,055,557, Cl. 260-162.000.

Bayer, Gunther; Fitzky, Hans Georg; Hoyer, Herbert; Luttgens, Gunter; and Muller-Bardorff, Wolfgang, to Agfa-Gevaert Aktiengesellschaft. Process for the improvement of the adhesion of photographic layers to a film web by means of a corona treatment. 4,055,685, Cl. 96-87.00R.

Bayorgeon, Jeffrey T.; Vandalen, Dirk J.; and Legrand, Pierre N., to Applied Power, Inc. Apparatus for reforming and straightening vehicles. 4,055,061, Cl. 72-32.000.

Beadle, Bruce R.; and Olig, Eugene A., to Giddings & Lewis, Inc. Interruptable numerical contouring control system with return to path safeguards. 4,055,787, Cl. 318-591.000.

Bearden, Roby, Jr.: *See—*
Mertzweiller, Joseph K.; and Bearden, Roby, Jr., 4,055,483, Cl. 208-213.000.

Beaujot, Norbert: *See—*
Brockman, Arnold; and Beaujot, Norbert, 4,055,148, Cl. 119-103.000.

Beavon, David K.; and Jirus, Earl J., to Ralph M. Parsons Company, The. Reducing gas generator. 4,055,401, Cl. 23-277.00C.

Beck, Herbert C., to Electronic Engineering Co. of California. Multiple switch mount. 4,055,738, Cl. 200-296.000.

Beck, Kurt-Gunther; Rohde, Wolfgang; Habermehl, Diethard; and Siebert, Werner, to Bergwerksverband GmbH. Method of restricting the formation of dust when feeding coal into coke ovens. 4,055,471, Cl. 201-20.000.

Becker, Frederick R., III, to Metropolitan Wire Corporation. Bumper assembly for a rolling cart. 4,055,362, Cl. 293-62.000.

Beecham Group Limited: *See—*
Green, Joseph; and Cawthorne, Michael Anthony, 4,055,635, Cl. 424-78.000.

Beery, Floyd T., to Hallmark Cards, Incorporated. Polyolefin web having remoistenable adhesive bonded thereto. 4,055,698, Cl. 428-262.000.

Beese, Ronald E., to American Can Company. Containers. 4,055,272, Cl. 220-64.000.

Belanger, Inc.: *See—*
Belanger, James A., 4,055,028, Cl. 51-334.000.

Belanger, James A., to Belanger, Inc. Replaceable, one piece, hinge-type, slot-engaging pack unit. 4,055,028, Cl. 51-334.000.

Bell, Heather, to Raymond Lee Organization, Inc., The, a part interest. Account and file book. 4,055,008, Cl. 40-104.190.

Bell & Howell Company: *See—*
Voss, Charles J.; and Nykiel, Theodore, 4,055,419, Cl. 96-1.0LY.

Bell Telephone Laboratories, Incorporated: *See—*
Angner, Ronald Joseph; and Lacy, James Volney, 4,055,731, Cl. 179-99.000.
Crawford, Charles David, 4,055,841, Cl. 340-347.0DD.
Panousis, Peter Theodore; Pritchett, Robert Leonard; and Smits, Friedolf Michael, 4,055,802, Cl. 324-73.0AT.

Belli, Frank G.: *See—*
Buckley, David A.; and Belli, Frank G., 4,055,418, Cl. 96-1.0PS.

Bellina, Russell Frank; and Fost, Dennis Lynn, to Du Pont de Nemours, E. I., and Company. Miticidal and aphicidal method utilizing 2-higher alkyl-3-hydroxy-1,4-naphthoquinone carboxylic acid esters. 4,055,661, Cl. 424-311.000.

Bellino, Jim. Bicycle lock. 4,055,060, Cl. 70-234.000.

Belmont, Edward Bruce, to RJR Foods, Inc. Package for storing and transporting tortillas or tacos. 4,055,670, Cl. 426-119.000.

Beloit Management & Research Center: *See—*
Hornbostel, Lloyd H., Jr., 4,055,844, Cl. 340-420.000.

Benedick, William B.; and Daniel, Charles J., to United States of America, Energy Research and Development Administration. Explosion containment device. 4,055,247, Cl. 206-3.000.

Benezra, Leo L.; Hill, David W.; Riihimaki, Arnold; and Tsai, Shan-Pu, to Diamond Shamrock Corporation. Method for lowering chlorate content of alkali metal hydroxides. 4,055,476, Cl. 204-98.000.

Bengtsson, Robert J., to AMI Industries, Inc. Chair clamp and restraint. 4,055,320, Cl. 248-501.000.

Bennett, Gregory B., to Sandoz, Inc. Furo(3,4-E)-as-triazines and corresponding 4-oxides as sleep inducers and minor tranquilizers. 4,055,643, Cl. 424-249.000.

Bennett, Richard Nelson: *See—*
Rosen, Sidney; and Bennett, Richard Nelson, 4,055,281, Cl. 222-309.000.

Benson, Harvey D.; Grunwell, Joyce Francis; Johnston, John O'Neal; and Petrow, Vladimir, to Richardson-Merrell Inc. Method of treating benign prostatic hypertrophy. 4,055,641, Cl. 424-242.000.

Berg, William H., Jr.: *See—*
Vig, Satinder K.; Koester, Harold J.; and Berg, William H., Jr., 4,054,965, Cl. 16-35.00D.

Berger, Heinz: *See—*
Gehring, Thilo; and Berger, Heinz, 4,055,157, Cl. 123-117.00R.

Bergthaller, Peter; Himmelmann, Wolfgang; Sauerteig, Wolfgang; and Rosenhahn, Lothar, to Agfa-Gevaert Aktiengesellschaft. Process of hardening a silver halide photographic material with a 1-carbamoyloxypyridinium salt. 4,055,427, Cl. 96-67.000.

Bergwerksverband GmbH: *See—*
Beck, Kurt-Gunther; Rohde, Wolfgang; Habermehl, Diethard; and Siebert, Werner, 4,055,471, Cl. 201-20.000.
Kolling, Georg; and Romey, Ingo, 4,055,583, Cl. 423-447.400.

Berlin, Herbert; Abrahams, Siegfried; and Brand, Peter, to Hauni-Werke Korber & Co., KG. Recovery of reusable tobacco particles in machines for the production of plain and filter tipped smokers products. 4,055,192, Cl. 131-84.00B.

Bernardot, Andre R.: *See—*
Raisin, Jean-Pierre A.; and Bernardot, Andre R., 4,055,244, Cl. 198-345.000.

Bernstein, Dell L. Curettement device. 4,055,167, Cl. 128-2.00B.

Bers, Abraham: *See—*
Stern, Ernest; Williamson, Richard C.; Bers, Abraham; and Cafarella, John H., 4,055,758, Cl. 364-821.000.

Bertelli, Aldo, to Rorer Italiana S.p.A. Derivatives of aminomethylcyclohexanecarboxylic acid. 4,055,580, Cl. 260-404.500.

Best, Francis Brian, to JWI Ltd. Method and apparatus for preventing the adherence of polarized foreign particles to paper machine components. 4,055,459, Cl. 162-192.000.

Bicking, John B.: *See—*
Cragoe, Edward J., Jr.; and Bicking, John B., 4,055,597, Cl. 260-534.00M.

Bieri, Hans, to Hydrostress Aktiengesellschaft. Clamping device, especially for rock or concrete drills. 4,055,353, Cl. 279-2.00R.

Binard, William J.: *See—*
Patel, Bhupendra C.; Binard, William J.; and McWhorter, Daniel M., 4,055,187, Cl. 128-349.00B.

Binder, Georg, to Robert Bosch G.m.b.H. Generator housing. 4,055,778, Cl. 310-89.000.

Binoche, Michel, to SKM. Equipment for spraying paint and the like. 4,055,300, Cl. 239-15.000.

Bjors, Nils G. Work piece clamp arrangements. 4,055,385, Cl. 85-1.0SS.

Blace, Zdenko: *See—*
Peska, Jan; Stamberg, Jiri; and Blace, Zdenko, 4,055,510, Cl. 252-426.000.

Black, James M., to United States of America, National Aeronautics and Space Administration. Window comparator. 4,055,777, Cl. 307-360.000.

Blair, Richard L. Cap for a widemouthed container. 4,055,267, Cl. 215-254.000.

Bland, Robert J.; and Seipel, Winfried, to Hewlett-Packard Company. Self commutated SCR power supply. 4,055,791, Cl. 363-28.000.

Blandin Wood Products: *See—*
Withoff, Alfred J.; and Schultz, David C., 4,055,205. Cl. 144-281.00R.

Blankenship, Charles P.: *See—*
Oldrieve, Robert E.; and Blankenship, Charles P., 4,055,416, Cl. 75-124.000.

Blaser, Don E.; and Molstedt, Byron V., to Exxon Research & Engineering Co. Elutriation in a fluid coking process. 4,055,484, Cl. 208-127.000.

Blaul, John Joseph, to Illinois Tool Works Inc. Locking fastener device. 4,055,208, Cl. 151-37.000.

Bloom, Allen: *See—*
Bartolini, Robert Alfred; and Bloom, Allen, 4,055,423, Cl. 96-27.00H.

Blue, Maurice R. Battery terminal post cleaner. 4,055,687, Cl. 427-142.000.

Bock, Jurgen; and Strutz, Hans-Jurgen, to Hoechst Aktiengesellschaft. Device for winding up yarns. 4,055,311, Cl. 242-18.0DD.

Boeing Company, The: *See—*
Greiss, Rashad S., 4,055,317, Cl. 244-118.00P.
Lynn, William Fred; and Walker, Gordon Marvin, 4,055,369, Cl. 308-187.100.

Bogorodsky, Jury Alexandrovich: *See—*
Bykhovsky, David Grigorievich; Medvedev, Alexandr Yakovlevich; Bogorodsky, Jury Alexandrovich; Firsov, Vladimir Nikolaevich; and Rossomakho, Yakov Vulfovich, 4,055,741, Cl. 219-121.00P.

Bolhofer, William A., to Merck & Co., Inc. N-(Sulfo-lower alkyl) amides of (3-trifluoromethylphenoxy) (4-chlorophenyl)acetic acid. 4,055,592, Cl. 260-507.00R.

Bonaiti, Francesco, to Tekma Kinomat S.p.A. Taping device in coil winders. 4,055,310, Cl. 242-7.080.

Bondarev, Konstantin Timofeevich: *See—*
Pavlushkin, Nikolai Mikheevich; Bondarev, Konstantin Timofeevich; Strekalov, Anatoly Vasilievich; Kozlovsky, Viktor Stepanovich; Minakov, Anatoly Gavrilovich; Golius, Tamara Efimovna; Orlova, Ljudmila Alexeevna; Sarkisov, Pavel Dzhibraelovich; Kozmin, Mikhail Ivanovich; and Minakov, Vladimir Anatolievich, 4,055,436, Cl. 106-52.000.

Bone, David P.: *See—*
Balaz, Alexander; Bone, David P.; and Shannon, Edward L., 4,055,681, Cl. 426-656.000.

Borden, Inc.: *See—*
Kirch, John Nicholas, 4,055,515, Cl. 252-542.000.

Bordt, Dale E.: *See—*
Torney, Harry L.; Torney, Helen T.; and Bordt, Dale E., 4,055,466, Cl. 195-1.700.

Borjesson, Anders, to Aktiebolaget Tudor. Method of arranging electrodes of storage batteries. 4,054,990, Cl. 29-623.100.

Borostyan, Stephen, to Xerox Corporation. Transfer charge maintaining system. 4,055,380, Cl. 355-3.00R.

Borzym, Alexander, to Alpha Industries, Inc. Die set for cutting I-beam. 4,055,096, Cl. 83-37.000.

Borzym, Alexander, to Alpha Industries, Inc. Severing knife for tube cutoff apparatus. 4,055,100, Cl. 83-454.000.

Boshinski, Edwin E.; Meckstroth, Robert C.; and Rogers, Robert M., to Hobart Corporation. Computing weighing scale. 4,055,748, Cl. 364-466.000.

Boshinski, Edwin E.: *See—*
Rogers, Robert M.; and Boshinski, Edwin E., 4,055,753, Cl. 364-466.000.

Bossinger, Charles D.: *See—*
Colescott, Robert L.; Kaiser, Emil; Bossinger, Charles D.; and Cook, Paul I., 4,055,524, Cl. 260-8.000.

Bott, John A. Vehicle article carrier. 4,055,284, Cl. 224-42.10D.

Bott, John A. Article supporting slat. 4,055,285, Cl. 224-42.10D.

Bouchard, Andre C.; Hall, Harold H., Jr.; Mercaldi, Renaldo; and Sentementes, Thomas J., to GTE Sylvania Incorporated. Signal device using percussive flashlamps. 4,055,759, Cl. 362-159.000.

Boynton, Kenneth G., to Hollis Engineering, Inc. Circuit board assembly. 4,055,725, Cl. 174-68.500.

Brackett, George E., to A. H. Emery Company, The. Heavy duty hydraulic weighing apparatus. 4,055,227, Cl. 177-208.000.

Brand, Glenn C. Coin operated timer. 4,055,243, Cl. 194-61.000.

Brand, Peter: *See—*
Berlin, Herbert; Abrahams, Siegfried; and Brand, Peter, 4,055,192, Cl. 131-84.00B.

Brandenstein, Manfred: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,055,371, Cl. 308-201.000.

Breite, Max. Lifting device for batteries and the like. 4,055,364, Cl. 294-63.00B.

Brenner, Wolf; Erlemann, Gustav; and Pauling, Horst, to Hoffmann-La Roche, Inc. Antiperspirants. 4,055,634, Cl. 424-47.000.

Brescia, Riccardo: *See—*
Conta, Renato; Montanari, Lucio; and Brescia, Riccardo, 4,055,743, Cl. 219-216.000.

Bridgegum, James Earl, to Mor-Flo Industries, Inc. Heat exchanger for solar energy. 4,054,981, Cl. 29-157.30R.

Bridgestone Tire Company Limited: *See—*
Fujisawa, Masao; Makise, Mitsugu; and Kadono, Mamoru, 4,055,136, Cl. 114-219.000.

Brinkmeier, Friedhelm, to Windmoller & Holscher. Apparatus for compressing and packaging stacks of flat superposed sheet articles. 4,055,034, Cl. 53-124.00C.

British Petroleum Company Limited, The: *See—*
Battersby, John; Forbes, Eric Simon; and Reid, Angus Joseph Dickson, 4,055,402, Cl. 44-58.000.
McCarroll, John James; Clark, John Trevor Kent; and Tennison, Stephen Robert, 4,055,628, Cl. 423-448.000.

Brockman, Arnold; and Beaujot, Norbert, to Brockman's Service Ltd. Animal holding clamp apparatus. 4,055,148, Cl. 119-103.000.

Brockman's Service Ltd.: *See—*
Brockman, Arnold; and Beaujot, Norbert, 4,055,148, Cl. 119-103.000.

Bromberg, Nathan S. Light measuring apparatus. 4,055,768, Cl. 250-461.00R.

Brown, Charles M.: *See—*
Brown, Harry J.; Forgeng, William D.; and Brown, Charles M., 4,055,742, Cl. 219-145.000.

Brown, Erben G., to Golden State Helicopter, Inc. Agrichemical spraying system. 4,055,303, Cl. 239-142.000.

Brown, Harry J.; Forgeng, William D.; and Brown, Charles M., to Union Carbide Corporation. Hard facing rod. 4,055,742, Cl. 219-145.000.

Brown, Ronald P.; and Harden, Jerrell W. Sub-soil breaking, surface-soil conditioning and planter machine. 4,055,126, Cl. 111-85.000.

Brown & Root, Inc.: *See—*
Abbott, Phillip Andrew, 4,055,264, Cl. 214-152.000.

Bryant, Herman G., Jr.: *See—*
Norman, Vello; and Bryant, Herman G., Jr., 4,055,191, Cl. 131-9.000.

Buchanan, John Gordon, to JWI Ltd. Paper machine shake. 4,055,460, Cl. 162-209.000.

Buck, Robert J. Electronic temperature control system for thermostatic control. 4,055,296, Cl. 236-1.00C.

Buckley, David A.; and Belli, Frank G., to Xerox Corporation. Migration imaging method using an imaging member employing a surface skin. 4,055,418, Cl. 96-1.0PS.

Buecher, Roger W.: *See—*
Hoffman, Robert T.; and Buecher, Roger W., 4,055,632, Cl. 423-657.000.

Bukac, Zbynek; Sebenda, Jan; and Suchy, Richard, to Ceskoslovenska akademie ved. Hot-melt adhesives based on anionic terpolymers of lactams. 4,055,552, Cl. 260-78.00L.

Burger, Richard A.: *See—*
McDonald, Walter; Seitel, Norbert F.; and Burger, Richard A., 4,055,455, Cl. 156-351.000.

Burgi, Henry R. Camper lifter device. 4,055,327, Cl. 254-47.000.

Burkl, Erich: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,055,371, Cl. 308-201.000.

Burley, David R., to Tile Council of America, Inc. Adhesive joint dressing compositions containing an alkali thickenable polymer. 4,055,529, Cl. 260-29.6RW.

Burns, Anthony G.: *See—*
Whetstone, Cecil, Jr.; and Burns, Anthony G., 4,055,065, Cl. 72-217.000.

Burroughs Corporation: *See—*
Collins, Joseph Martin, 4,055,101, Cl. 83-660.000.

Burton, Elwin E. Skateboard with brake. 4,055,234, Cl. 188-2.00R.

Bussmann, Egon; Flamme, Bruno; Vanhumbeeck, Jacky; Helder, Johannes; and De Steur, Hubert, to Siemens Aktiengesellschaft. Process control system for the automatic analysis and regeneration of galvanic baths. 4,055,751, Cl. 364-500.000.

Buxbaum, Lothar: *See—*
Herzog, Hans; Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jurgen, 4,055,570, Cl. 548-301.000.

Bykhovsky, David Grigorievich; Medvedev, Alexandr Yakovlevich; Bogorodsky, Jury Alexandrovich; Firsov, Vladimir Nikolaevich; and Rossomakho, Yakov Vulfovich. Plasma arc torch. 4,055,741, Cl. 219-121.00P.

Byrne, Edward A.: *See—*
Frey, Kenneth H., 4,055,106, Cl. 91-495.000.

Byrne, Gladys U.: *See—*
Frey, Kenneth H., 4,055,106, Cl. 91-495.000.

C.G.R.-Mev.: *See—*
Milcamps, Jacques; and Penet, Alain, 4,055,770, Cl. 250-505.000.

Cafarella, John H.: *See—*
Stern, Ernest; Williamson, Richard C.; Bers, Abraham; and Cafarella, John H., 4,055,758, Cl. 364-821.000.

Cairns, Hugh; Chambers, Albert; and Lee, Thomas Brian, to Fisons Limited. 6,8-Di-t-butyl-4-oxo-4H-1-benzopyran-2-carboxylic acid and derivative for the prevention of asthmatic symptoms. 4,055,654, Cl. 424-283.000.

Calcagno, Benedetto: *See—*
Cocuzza, Gioacchino; Montoro, Italo; and Calcagno, Benedetto, 4,055,579, Cl. 260-348.340.

Calumet Petrochemicals, Inc.: *See—*
Jarreau, Charles L., Sr., 4,055,605, Cl. 260-624.00R.

Camid Intermatic: *See—*
Carnegie, Frank, Jr., 4,055,456, Cl. 156-366.000.

Camirand, Wayne M.: *See—*
Popper, Karel; Schultz, William G.; Camirand, Wayne M.; Hautala, Earl; Robertson, George H.; Crawford, Ladell; and Finkle, Bernard J., 4,055,675, Cl. 426-470.000.

Campbell, Gerald Allan: *See—*
Holmes, Edmund Thompson; and Campbell, Gerald Allan, 4,055,429, Cl. 96-74.000.

Campbell, Steven J.: *See—*
Fleming, Phillip F.; and Campbell, Steven J., 4,055,309, Cl. 241-221.000.

Caporusso, Alessandro; and Caporusso, Mario. Portable manually controlled hydraulic pipe bending apparatus. 4,055,069, Cl. 72-389.000.

Caporusso, Mario: *See—*
Caporusso, Alessandro; and Caporusso, Mario, 4,055,069, Cl. 72-389.000.

Cappiello, Luciano. Gas saving device. 4,055,159, Cl. 123-119.00B.

Carabateas, Philip M.; and Williams, Gordon L., to Sterling Drug Inc. Tetra-(lower-alkyl)3-(3-nitrophenyl)-1,5-pentanedione-1,2,4,5-tetracarboxylates. 4,055,588, Cl. 560-23.000.

Caratsch, Hans-Peter. Method and apparatus for applying synthetic resin powder in a grate-shaped coating to web material. 4,055,688, Cl. 427-195.000.

Cargill, Incorporated: *See—*
Panandiker, K. A. Pai; and Tweet, David E., 4,055,550, Cl. 260-77.5AA.
Panandiker, K. A. Pai; and Tweet, David E., 4,055,551, Cl. 260-77.5AA.

Carl Zeiss-Stiftung: *See—*
Kappe, Walter; Lampe, Gotz-Reinhard; and Neuer, Harald, 4,055,752, Cl. 364-551.000.

Carle, Frank Louis. Aquatic-life depletion-sampling device and technique. 4,055,087, Cl. 73-421.00R.

Carleton, Peter S.; Ewen, James H., Jr.; and Reymore, Harold E., Jr., to Upjohn Company, The. Storage-stable liquid polyisocyanate composition. 4,055,548, Cl. 260-77.5AT.

Carlisle, Richard S. Method and apparatus for severing and edge-sealing thermoplastic films, and product. 4,055,452, Cl. 156-251.000.

Carnegie, Frank, Jr., to Camid Intermatic. Impulse heat-sealing machine. 4,055,456, Cl. 156-366.000.

Casey, Thomas P.; Hansen, Howard A.; Klett, Gene R.; and Olthoff, James A., to Caterpillar Tractor Co. Corner tooth assembly for an earthmoving implement having a hollow rearward portion. 4,055,223, Cl. 172-777.000.

Cassano, James R.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,055,340, Cl. 271-236.000.

Cassidy, Hugh I. Permeable liner having concrete setting retardant. 4,055,322, Cl. 249-187.00R.
Caterpillar Tractor Co.: *See—*
Casey, Thomas P.; Hansen, Howard A.; Klett, Gene R.; and Olthoff, James A., 4,055,223, Cl. 172-777.000.
Nieman, John R., 4,055,214, Cl. 164-241.000.
Schexnayder, Lawrence F., 4,055,046, Cl. 60-428.000.
Sogge, John W., 4,055,368, Cl. 305-57.000.
CAV Limited: *See—*
Potter, James Charles, 4,055,387, Cl. 417-221.000.
Cawthorne, Michael Anthony: *See—*
Green, Joseph; and Cawthorne, Michael Anthony, 4,055,635, Cl. 424-78.000.
Celanese Corporation: *See—*
Thompson, Darrell R., 4,055,532, Cl. 260-32.400.
Centre Technique Industriel dit Institut Textile de France: *See—*
Raisin, Jean-Pierre A.; and Bernardot, Andre R., 4,055,244, Cl. 198-345.000.
Centro Sperimentale Metallurgico S.p.A.: *See—*
Ramacciotti, Aldo; and Repetto, Eugenio, 4,055,215, Cl. 164-252.000.
Cesca, Sebastiano: *See—*
Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, 4,055,535, Cl. 260-45.70R.
Cesin, Louie P. Underwater sight for a spear gun or the like. 4,055,000, Cl. 33-241.000.
Ceskoslovenska akademie ved: *See—*
Bukac, Zbynek; Sebenda, Jan; and Suchy, Richard, 4,055,552, Cl. 260-78.00L.
Peska, Jan; Stamberg, Jiri; and Blace, Zdenko, 4,055,510, Cl. 252-426.000.
Chai, Sie-Yearl; and Yardley, John P., to American Home Products Corporation. (Gly_3-Ala)^1-somatostatin. 4,055,553, Cl. 260-112.50S.
Chambers, Albert: *See—*
Cairns, Hugh; Chambers, Albert; and Lee, Thomas Brian, 4,055,654, Cl. 424-283.000.
Champenois, Charles E., Jr. Protective coverings for snow ski bindings with carrying case. 4,055,287, Cl. 224-45.00S.
Champion International Corporation: *See—*
Cohn, Robert, 4,055,295, Cl. 229-80.000.
Chana, Maghar S.: *See—*
Kraley, Raymond L.; Pressman, Barry M.; and Chana, Maghar S., 4,055,803, Cl. 324-142.000.
Chance, Leon H.; and Timpa, Judy D., to United States of America, Agriculture. Diaminotrihalopropyl triazines: and their methylol derivatives. 4,055,720, Cl. 544-205.000.
Chapman, Donald A. Lifting device for raising and freeing stuck vehicles. 4,055,330, Cl. 254-131.000.
Chasar, Dwight William, to B. F. Goodrich Company, The. 5-Hydroxydiphenyl sulfoxide compositions. 4,055,540, Cl. 260-45.95C.
Chase, Wendell D., to United States of America, National Aeronautics and Space Administration. Full color hybrid display for aircraft simulators. 4,055,004, Cl. 35-12.00N.
Chaveron, Michel: *See—*
Badertscher, Ernest; Chaveron, Michel; and Wenner, Valentin, 4,055,555, Cl. 260-119.000.
Chen, Alwin Bennett; and Pallo, John Matthew, to Johns-Manville Corporation. Refractory fiber composition and intermediate temperature range fibrous insulation composed thereof. 4,055,434, Cl. 106-50.000.
Cheng, Jiin Duey, to Du Pont de Nemours, E. I., and Company. Substituted bromo- or chloroacetamide herbicides. 4,055,410, Cl. 71-90.000.
Cheng, Thomas T., to Union Camp Corporation. Novel polyamide adhesives and method of preparation. 4,055,525, Cl. 260-18.00N.
Chesley, Gilman D. Memory device and method of testing the same. 4,055,754, Cl. 235-302.300.
Chevron Research Company: *See—*
Lavigne, Joe B., 4,055,531, Cl. 260-31.80B.
Chierici, Osvaldo F.; and Murphy, Richard F., to Holland Company. Self lubricating yoke wear plate arrangement. 4,055,254, Cl. 213-61.000.
Chipper, John Lester; and Owner, Donald Bruce. Method and equipment for aerial transport. 4,055,316, Cl. 244-33.000.
Chloride Silent Power Limited: *See—*
May, Geoffrey John; and McNamee, Michael, 4,055,710, Cl. 429-104.000.
Choay S.A.: *See—*
Sache, Edgar, 4,055,648, Cl. 424-260.000.
Choi, Charles K.; and Tassoney, Joseph P., to Occidental Petroleum Corporation. Method and apparatus for handling solid fluidized particles. 4,055,486, Cl. 209-11.000.
Christensen, Ronald J.; and Zivtins, George J., to Nalco Chemical Company. Enzymatic dispersion of biological slimes. 4,055,467, Cl. 195-2.000.
Christenson, Roger M.: *See—*
Sullivan, Thomas R.; Christenson, Roger M.; Das, Suryya K.; and Dowbenko, Rostyslaw, 4,055,607, Cl. 260-851.000.
Christiansen, Robert George, to Sterling Drug Inc. Process for preparing pregn-20-yne compounds and novel product produced thereby. 4,055,562, Cl. 260-239.55R.
Christophliemk, Peter; Friedemann, Wolfgang; Vaeth, Ernst; and Worms, Karl-Heinz, to Henkel Kommanditgesellschaft auf Aktien; and Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of zeolitic alkali metal aluminosilicates. 4,055,622, Cl. 423-118.000.
Christy, Marcia Elizabeth, to Merck & Co., Inc. Treating arrythmia with phenylthioaralkylamines. 4,055,665, Cl. 424-330.000.
Chu, Joseph Yung-Chang; and Schank, Richard Louis, to Xerox Corporation. Novel microfilm and process for preparation. 4,055,424, Cl. 96-35.100.
Chu, Simon L.; Sharowsky, Robert; and Shu, Peter, to Polychrome Corporation. Apparatus for meniscus coating of a moving web. 4,055,144, Cl. 118-401.000.
Chu, Tze Yao; and Wenger, George Michael, to Western Electric Company, Inc. Method for maintaining a vapor blanket in a condensation heating facility. 4,055,217, Cl. 165-1.000.
Chu, Tzong Jeng; and Konii, Susumu, to Hitachi Chemical Company, Ltd. Novel thermosetting resins and process for preparing the same. 4,055,546, Cl. 260-51.00R.
Chubukoki Kabushiki Kaisha: *See—*
Mitsubayashi, Yoshihiko, 4,055,099, Cl. 83-403.000.
Chupp, John P., to Monsanto Company. Herbicidal composition and method of use. 4,055,414, Cl. 71-111.000.
Chynoweth, Lawrence L.; and Tech, Kurt O., to Cross Company, The. Control system for compensating for machine tool wear. 4,055,386, Cl. 408-13.000.
Ciba-Geigy AG: *See—*
Kyburz, Rolf; and Kitzing, Rainer, 4,055,431, Cl. 96-111.000.
Ciba-Geigy Corporation: *See—*
Arya, Vishwa Prakash; and Nagarajan, Kuppuswamy, 4,055,647, Cl. 424-251.000.
Babler, Fridolin; Mollet, Hans; and Zwahlen, Gunther, 4,055,439, Cl. 106-288.00Q.
Cseh, Georg; and Mueller, Willy, 4,055,559, Cl. 260-176.000.
Dawes, Dag; and Thummel, Rudolph C., 4,055,572, Cl. 260-308.00R.
Fischer, Hanspeter, 4,055,411, Cl. 71-92.000.
Garner, Robert; and Petitpierre, Jean Claude, 4,055,358, Cl. 282-27.500.
Herzog, Hans; Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jurgen, 4,055,570, Cl. 548-301.000.
Huber-Emden, Helmut; Eschle, Karl; and Maeder, Arthur, 4,055,599, Cl. 260-562.00S.
Kny, Hermann, 4,055,584, Cl. 260-448.20E.
Koller, Stefan; Pacher, Marielise; and Emmenegger, Karl, 4,055,392, Cl. 8-21.00C.
Nachbur, Hermann; and Maeder, Arthur, 4,055,689, Cl. 427-379.000.
Rosenberger, Siegfried, 4,055,539, Cl. 260-45.95C.
Schafer, Paul; Abel, Heinz; and Mayer, Fritz, 4,055,393, Cl. 8-62.000.
Wheeler, Ian Robert; and Robertson, George Heddle, 4,055,440, Cl. 106-288.00Q.
Civardi, Frank Peter, to Inmont Corporation. Leatherlike fabrics. 4,055,693, Cl. 428-91.000.
Clark, Earl: *See—*
Moczygemba, George A.; Johnson, W. Delmar; and Clark, Earl, 4,055,713, Cl. 526-207.000.
Clark Equipment Company: *See—*
Bauer, James J.; Albright, Larry E.; Werner, James L.; Sagaser, Thomas M.; and Hoechst, Lonnie D., 4,055,262, Cl. 214-140.000.
Holmes, Donald E.; Howard, Wayne R.; Fisher, John F.; and Zeller, Burton S., 4,055,228, Cl. 180-14.00B.
Tamas, Attila J., 4,055,260, Cl. 214-44.00R.
Clark, John Trevor Kent: *See—*
McCarroll, John James; Clark, John Trevor Kent; and Tennison, Stephen Robert, 4,055,628, Cl. 423-448.000.
Clarke Chapman, Ltd.: *See—*
Cummings, Robert James, 4,055,151, Cl. 122-7.00B.
Claxton, George P.: *See—*
Grisar, J. Martin; Claxton, George P.; and MacKenzie, Robert D., 4,055,561, Cl. 260-239.00B.
Clayman, William: *See—*
Goodenough, David John; Weaver, Kenneth E.; Smrcka, Joseph G.; and Clayman, William, 4,055,771, Cl. 250-505.000.
Clemens, Anton Hubert; and Myers, Robert Weston, to Miles Laboratories, Inc. Blood glucose control apparatus. 4,055,175, Cl. 128-213.000.
Clements, Herbert Arthur; and Heybourne, Robert Howard, to S.S.S. Patents Limited. Fluid operated toothed clutch with dashpot. 4,055,240, Cl. 192-67.00A.
Cline, James E. D.: *See—*
Abraham, Robert C.; and Cline, James E. D., 4,055,814, Cl. 331-1.00A.
Close, Ralph E.; and Oroshnik, William, to SCM Corporation. Synthesis of dehydrophytol and vitamin E. 4,055,575, Cl. 260-345.500.
Coal Industry (Patents) Limited: *See—*
Jarvis, William Joseph, 4,055,367, Cl. 299-53.000.
Cockbain, Alan Gray; Latimer, Michael John; and Parr, Norman Lawrence. Composite materials. 4,055,451, Cl. 156-89.000.
Cocuzza, Gioacchino; Montoro, Italo; and Calcagno, Benedetto, to Societa' Italina Resine S.I.R. S.p.A. Process for the production of ethylene oxide. 4,055,579, Cl. 260-348.340.
Cohen, Milton J. Hypodermic syringe. 4,055,177, Cl. 128-218.00M.
Cohn, Robert, to Champion International Corporation. Self-sealing envelope and method of making same. 4,055,295, Cl. 229-80.000.
Coleman, David M.: *See—*
Walters, John P.; and Coleman, David M., 4,055,783, Cl. 315-241.00R.
Colescott, Robert L.; Kaiser, Emil; Bossinger, Charles D.; and Cook,

Paul I., to Armour Pharmaceutical Company. Synthesis of peptides. 4,055,524, Cl. 260-8.000.
Colgate-Palmolive Company: *See—*
Gray, Frederick W., 4,055,505, Cl. 252-102.000.
Karami, Hamzeh, 4,055,180, Cl. 128-287.000.
Karami, Hamzeh, 4,055,184, Cl. 128-287.000.
Mack, Robert John, 4,055,182, Cl. 128-287.000.
Colley, Rowan Herbert, to Rolls-Royce Limited. Bypass gas turbine fan employing a stub rotor stage and a main rotor stage. 4,055,042, Cl. 60-226.00R.
Collins, Joseph Martin, to Burroughs Corporation. Roll fed rotary web device with improved perforator. 4,055,101, Cl. 83-660.000.
Collins, William J. Device and method for obtaining one or more samples of liquid. 4,055,086, Cl. 73-425.40R.
Combustion Engineering, Inc.: *See—*
Torres, Jose Marcelo, 4,055,463, Cl. 176-24.00R.
Comex Systems, Inc.: *See—*
Stapleford, Gary N.; and Sandahl, Joel E., 4,055,730, Cl. 179-84.0VF.
Commissariat a l'Energie Atomique: *See—*
Allemand, Robert, 4,055,767, Cl. 250-385.000.
Faugeras, Pierre; Lecoq, Pierre; Miquel, Pierre; Rouyer, Hubert; and Simonet, Guy, 4,055,625, Cl. 423-262.000.
Lemercier, Guy, 4,055,464, Cl. 176-87.000.
Commissiariat a l'Energie Atomique: *See—*
Lemercier, Guy, 4,055,465, Cl. 176-87.000.
Congelliere, Peter. Push switch. 4,055,736, Cl. 200-16.00A.
Conklin, Harold A., Jr., to D. H. Baldwin Company. Apparatus for wrapping strings for musical instruments. 4,055,038, Cl. 57-11.000.
Conrad, Jack R. Flexible mold and process. 4,055,620, Cl. 264-313.000.
Conta, Renato; Montanari, Lucio; and Brescia, Riccardo, to Ing. C. Olivetti & C., S.p.A. Electrothermal print head. 4,055,743, Cl. 219-216.000.
Container Corporation of America: *See—*
Stramaglia, Melchiore M., 4,055,293, Cl. 229-31 0FS.
Continental Group, Inc., The: *See—*
Ostrem, Obert M.; Kulikowski, Donald F.; and Pulciani, Sam C., 4,055,134, Cl. 113-121.00C.
Continental Oil Company: *See—*
Weimer, Dean R., 4,055,509, Cl. 252-363.500.
Cook, Paul I.: *See—*
Colescott, Robert L.; Kaiser, Emil; Bossinger, Charles D.; and Cook, Paul I., 4,055,524, Cl. 260-8.000.
Cooper, Dale W.: *See—*
Steinberg, Robert; Alger, Donald L.; and Cooper, Dale W., 4,055,686, Cl. 427-124.000.
Coppola, Gary M.: *See—*
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Cordes, Claus: *See—*
Doerfel, Helmut; Schmidt, Franz; Schuette, Wilhelm; Cordes, Claus; and Schenk, Wolfgang, 4,055,547, Cl. 260-67.0FP.
Cornell, William D., to Sherwood Medical Industries Inc. Fluid collection device with phase partitioning means. 4,055,501, Cl. 210-516.000.
Cornils, Boy: *See—*
Feichtinger, Hans; Payer, Wolfgang; Cornils, Boy; and Weber, Jurgen, 4,055,586, Cl. 260-465.50R.
Costello, Frederick A.; Manniso, James L.; DiPinto, Anthony J.; and Smith, Gerald W. Solar heating system. 4,055,163, Cl. 126-271.000.
Coster, Hans; Pilwat, Gunter; and Zimmermann, Ulrich, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of and device for measuring elastic and di-electric properties of the diaphragm of living cells. 4,055,799, Cl. 324-71.00R.
Cote, Donald F. Card apparatus. 4,055,012, Cl. 40-129.00C.
Cowan, Arnold. Helical spring retracting tool. 4,054,983, Cl. 29-227.000.
Cragoe, Edward J., Jr.; and Jones, James H., to Merck & Co., Inc. 11,12-Seco-prostaglandins. 4,055,596, Cl. 260-534.00M.
Cragoe, Edward J., Jr.; and Bicking, John B., to Merck & Co., Inc. 10-Aza-11,12-secoprostaglandins. 4,055,597, Cl. 260-534.00M.
Crawford, Charles David, to Bell Telephone Laboratories, Incorporated. Optical Gray to binary code converter. 4,055,841, Cl. 340-347.0DD.
Crawford, G. Roger; Sanders, Duane; and Shill, David B., to Thermoguard Insulation Co. Loose fill cellulose insulation material packing machine. 4,055,203, Cl. 141-73.000.
Crawford, Ladell: *See—*
Popper, Karel; Schultz, William G.; Camirand, Wayne M.; Hautala, Earl; Robertson, George H.; Crawford, Ladell; and Finkle, Bernard J., 4,055,675, Cl. 426-470.000.
Creighton, Peter J.: *See—*
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Creps, John L.; McEwen, Stephen N.; and Myerholtz, Arthur D., to Henry Manufacturing Co., Inc. Hold-down mechanism for scraper conveyor and settling tank. 4,055,497, Cl. 210-91.000.
Crest Industries, Inc.: *See—*
Rasmussen, Harry R., 4,055,737, Cl. 200-51.00R.
Croon & Lucke Maschinenfabrik GmbH & Co. KG: *See—*
Lucke, Florian, 4,055,312, Cl. 242-43.100.
Crosby, Guy A.; and DuBois, Grant E., to Dynapol. Sweetener derivatives. 4,055,678, Cl. 426-548.000.
Crosher, Frederick K., to Optical Coating Laboratory, Inc. Silicon solar cell construction having two layer anti-reflection coating. 4,055,442, Cl. 136-89.0CC.
Cross Company, The: *See—*
Chynoweth, Lawrence L.; and Tech, Kurt O., 4,055,386, Cl. 408-13.000.
Cross, John Viscount: *See—*
Linton, John H.; Esdale, William J.; and Cross, John Viscount, 4,055,667, Cl. 426-62.000.
Cseh, Georg; and Mueller, Willy, to Ciba-Geigy Corporation. Disazo pigment containing at least 2 chlorine atoms and process for their manufacture. 4,055,559, Cl. 260-176.000.
Csepeli Femmu: *See—*
Stefan, Mihaly; Nagy, Tibor; and Daroczi, Sandor, 4,055,415, Cl. 75-74.000.
CTS Corporation: *See—*
Leung, Tommy Y., 4,055,772, Cl. 307-10.00R.
Cummings, Robert James, to Clarke Chapman, Ltd. Waste heat boiler. 4,055,151, Cl. 122-7.00B.
Cunningham, Eldon R., to General Electric Company. Dynamoelectric machine lubrication system and method of assembling the same. 4,055,370, Cl. 308-36.100.
Cutler-Hammer, Inc.: *See—*
Piber, Earl T., 4,055,739, Cl. 200-315.000.
D. H. Baldwin Company: *See—*
Conklin, Harold A., Jr., 4,055,038, Cl. 57-11.000.
Daberko, Gunter W., to Rockwell International Corporation. Calibration reticle for measuring microscopes. 4,055,376, Cl. 350-10.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Kan, Osamu, 4,055,109, Cl. 93-35.00R.
Daido Seiko Kabushiki Kaisha: *See—*
Fujikura, Masakuni; and Abe, Naohiro, 4,055,448, Cl. 148-38.000.
Daimer, Wolfgang. Process for collecting paint spray mists in spray paint operation. 4,055,404, Cl. 55-85.000.
Daimer, Wolfgang, to Vianova Kunstharz A.G. Process for producing water-soluble organic macromolecules, and the water-soluble organic macromolecules obtained. 4,055,517, Cl. 260-2.0EP.
D'Alelio, Gaetano Francis. Chain-extending Schiff base terminated polyimides and method of preparation. 4,055,543, Cl. 260-47.0CP.
D'Alesandris, Loreto B.: *See—*
Marres, George; and D'Alesandris, Loreto B., 4,054,986, Cl. 29-434.000.
Dalkin, Stanislaw: *See—*
Hughes, John F.; and Dalkin, Stanislaw, 4,055,324, Cl. 251-309.000.
Damman, Cornelis Christiaan, to Holland Mechanics B.V. Method of forming circularly bent articles, in particular wheel rims, from a straight metal profile strip and apparatus for performing the method. 4,054,982, Cl. 29-159.100.
Danfoss A/S: *See—*
Andersen, Erik, 4,055,823, Cl. 335-255.000.
Daniel, Charles J.: *See—*
Benedick, William B.; and Daniel, Charles J., 4,055,247, Cl. 206-3.000.
D'Antonio, Nicholas F.; Bates, Richard L.; and French, Richard W. Strain transducer. 4,055,078, Cl. 73-88.50R.
Daroczi, Sandor: *See—*
Stefan, Mihaly; Nagy, Tibor; and Daroczi, Sandor, 4,055,415, Cl. 75-74.000.
Das, Suryya K.: *See—*
Jozwiak, Edward L., Jr.; and Das, Suryya K., 4,055,527, Cl. 260-23.70A.
Sullivan, Thomas R.; Christenson, Roger M.; Das, Suryya K.; and Dowbenko, Rostyslaw, 4,055,607, Cl. 260-851.000.
Dastur, Kavsy D.; and Gorski, Robert A., to Du Pont de Nemours, E. I., and Company. Methylpentane/$CClF_2CH_2Cl$ azeotropic mixtures. 4,055,507, Cl. 252-162.000.
Datta, Pabitra: *See—*
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Davis, Curry Beach: *See—*
Schluenz, Robert William; and Davis, Curry Beach, 4,055,576, Cl. 260-346.600.
Davy Powergas GmbH: *See—*
Saffran, Helmut; and Sterck, Lothar, 4,055,577, Cl. 260-346.700.
Dawes, Dag; and Thummel, Rudolph C., to Ciba-Geigy Corporation. Process for the production of 3-hydroxy-1,2,4-triazole derivatives. 4,055,572, Cl. 260-308.00R.
Day, Maurice R.: *See—*
Klamm, Robert L.; and Day, Maurice R., 4,055,252, Cl. 209-74.00M.
De Laval Turbine Inc.: *See—*
Raymond, Robert E., 4,055,197, Cl. 137-84.000.
De Barsy, Philippe. Crash helmet. 4,054,953, Cl. 2-414.000.
Dederra, Helmut; Schmidt, Gunther; and Stanke, Jurgen, to Messerschmitt-Bolkow-Blohm GmbH. Rocket engine construction and connection for closed and opened fluid cooling circuits for the walls thereof. 4,055,044, Cl. 60-265.000.
de Groot, Hans. Safety ski binding. 4,055,356, Cl. 280-628.000.
Delarge, Jacques E.; Lapiere, Charles L.; and Georges, Andre H., to A. Christiaens Societe Anonyme. Certain 4-phenoxy(or phenylthio)-3-n-acylated-sulfonamido-pyridines. 4,055,650, Cl. 424-263.000.
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Bussmann, Egon; Flamme, Bruno; Vanhumbeeck, Jacky; Helder, Johannes; and De Steur, Hubert, 4,055,751, Cl. 364-500.000.
Detrex Chemical Industries, Inc.: *See—*
Kearney, Thomas J., 4,055,196, Cl. 134-107.000.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Christophliemk, Peter; Friedemann, Wolfgang; Vaeth, Ernst; and Worms, Karl-Heinz, 4,055,622, Cl. 423-118.000.
Kunst, Helmut; and Scondo, Christian, 4,055,446, Cl. 148-15.000.

Offermanns, Heribert; and Posselt, Klaus, 4,055,653, Cl. 424-275.000.
Devon Products, Inc.: *See*—
Doeleman, Henry, 4,055,797, Cl. 324-30.00R.
Diaferia, Henry V.: *See*—
DiMatteo, Paul L.; and Diaferia, Henry V., 4,054,959, Cl. 5-81.00R.
Diamond, Harry. User-formed urination trough. 4,054,957, Cl. 4-110.000.
Diamond Shamrock Corporation: *See*—
Benezra, Leo L.; Hill, David W.; Riihimaki, Arnold; and Tsai, Shan-Pu, 4,055,476, Cl. 204-98.000.
Peters, Edward J., 4,055,291, Cl. 228-108.000.
Dieck, Ronald L.; and Quinn, Edwin J., to Armstrong Cork Company. Polyphosphazene blends. 4,055,520, Cl. 260-2.50R.
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Dieck, Ronald L.; and Quinn, Edwin J., to Armstrong Cork Company. Smoke-suppressant additives for polyphosphazenes. 4,055,545, Cl. 260-47.00P.
Digital Equipment Corporation: *See*—
Jenkins, Stephen R.; Northrup, Thomas A.; and Stewart, Robert E., 4,055,851, Cl. 364-200.000.
DiMarzio, Alfred W., to General Electric Company. Control system for time sharing multiple stepper motors with a single controller. 4,055,786, Cl. 318-562.000.
DiMatteo, Paul L.; and Diaferia, Henry V., to Dynell Electronics Corporation. Invalid bed arrangement. 4,054,959, Cl. 5-81.00R.
Dimeff, John, to United States of America, National Aeronautics and Space Administration. Optically selective, acoustically resonant gas detecting transducer. 4,055,764, Cl. 250-336.000.
Dimmer, Donald J.: *See*—
Lasater, Henry C., 4,055,789, Cl. 320-6.000.
DiPinto, Anthony J.: *See*—
Costello, Frederick A.; Manniso, James L.; DiPinto, Anthony J.; and Smith, Gerald W., 4,055,163, Cl. 126-271.000.
Diss, Edward M., to Dow Chemical Company, The. Apparatus for sampling dry solids. 4,055,088, Cl. 73-424.000.
Divajex: *See*—
Pelton, Robert J., 4,055,188, Cl. 128-402.000.
Doeleman, Henry, to Devon Products, Inc. Electrolytic conductance meter. 4,055,797, Cl. 324-30.00R.
Doerfel, Helmut; Schmidt, Franz; Schuette, Wilhelm; Cordes, Claus; and Schenk, Wolfgang. Removing odorous formaldehyde from stabilized shaped polyoxymethylenes. 4,055,547, Cl. 260-67.0FP.
Dokoupil, Jiri. Methods and apparatus for dewatering leather. 4,055,059, Cl. 69-41.000.
Dombchik, Steven Arnold, to Du Pont de Nemours, E. I., and Company. Sulfophenyl-azo-phenyl-azo-(4-hydroxyalkoxyphenyl) compounds. 4,055,560, Cl. 260-186.000.
Dor, Abraham A.: *See*—
McGauley, Patrick J.; and Dor, Abraham A., 4,055,631, Cl. 423-558.000.
Dotson, Ronald L.; Justice, David D.; and Kuo, Han C., to Olin Corporation. Method for operating electrolytic diaphragm cells. 4,055,475, Cl. 204-98.000.
Dow Chemical Company, The: *See*—
Baggett, Joseph McClendon, 4,055,544, Cl. 260-47.0XA.
Diss, Edward M., 4,055,088, Cl. 73-424.000.
Lee, John M., 4,055,598, Cl. 260-553.00B.
Dowbenko, Rostyslaw: *See*—
Sullivan, Thomas R.; Christenson, Roger M.; Das, Suryya K.; and Dowbenko, Rostyslaw, 4,055,607, Cl. 260-851.000.
Dowell, Frederick Sidney, to Dunlop Limited. Disc brake with an annular metal frame holding part-circular pads. 4,055,236, Cl. 188-73.200.
Dreano, Edward L., Jr.: *See*—
Wingate, Sidney A.; and Dreano, Edward L., Jr., 4,055,070, Cl. 72-461.000.
Drechsel, Erhart Karl; and Sardisco, John B., to Pennzoil Company. Method of producing fluoride-free phosphoric acid. 4,055,626, Cl. 423-320.000.
Dresser Industries, Inc.: *See*—
Petrak, Daniel Ralph, 4,055,437, Cl. 106-64.000.
Wetterhorn, Richard Harry, 4,055,085, Cl. 73-418.000.
DuBois, Grant E.: *See*—
Crosby, Guy A.; and DuBois, Grant E., 4,055,678, Cl. 426-548.000.
Duckett, Herbert John, to Tasman Joinery Company Limited. Construction element. 4,055,318, Cl. 248-243.000.
Ducret, Lucien C. Automatic cutter for armored cable. 4,055,097, Cl. 83-169.000.
Dudziak, Thaddeus J., to United States of America, Army. Cylinder firing indicator. 4,055,079, Cl. 73-117.300.
Duke, Gene L. Pelletizing cotton lint. 4,055,680, Cl. 426-635.000.
Dunlop Limited: *See*—
Dowell, Frederick Sidney, 4,055,236, Cl. 188-73.200.
Goodfellow, Anthony Gerald, 4,055,619, Cl. 264-258.000.
Du Pont de Nemours, E. I., and Company: *See*—
Bellina, Russell Frank; and Fost, Dennis Lynn, 4,055,661, Cl. 424-311.000.
Cheng, Jiin Duey, 4,055,410, Cl. 71-90.000.
Dastur, Kavsy D.; and Gorski, Robert A., 4,055,507, Cl. 252-162.000.
Dombchik, Steven Arnold, 4,055,560, Cl. 260-186.000.
Fowler, John Rayford; and Hogan, Edward Merrick, 4,055,201, Cl. 139-421.000.
Johnson, Alexander L.; and Sweetser, Philip B., 4,055,409, Cl. 71-76.000.
Lin, Perry Han-Cheng, 4,055,040, Cl. 57-140.0BY.
Wat, Edward Koon Wah, 4,055,412, Cl. 71-92.000.
Durkin, John, to United States of America, Interior. Radon daughter dosimeter. 4,055,762, Cl. 250-253.000.
Dworkin, Barry R.: *See*—
Miller, Neal E.; and Dworkin, Barry R., 4,055,168, Cl. 128-2.00S.
Dyakov, Valery Mikhailovich: *See*—
Voronkov, Mikhail Grigorievich; Platonova, Ada Timofeevna; Mansurova, Ljudmila Andreevna; Kuznetsov, Igor Georgievich; Zelchan, Gunar Izidorovich; and Dyakov, Valery Mikhailovich, 4,055,637, Cl. 424-184.000.
Dyer, Billy F., to Hughes Tool Company. Drill string shock absorbing apparatus. 4,055,338, Cl. 267-125.000.
Dynamics Research Corporation: *See*—
Wingate, Sidney A.; and Dreano, Edward L., Jr., 4,055,070, Cl. 72-461.000.
Dynapol: *See*—
Crosby, Guy A.; and DuBois, Grant E., 4,055,678, Cl. 426-548.000.
Weinshenker, Ned M., 4,055,604, Cl. 260-618.00H.
Dynell Electronics Corporation: *See*—
DiMatteo, Paul L.; and Diaferia, Henry V., 4,054,959, Cl. 5-81.00R.
Eachus, Joseph J.; and Graff, Theodore S., to Honeywell Information Systems Inc. Touch sensitive device. 4,055,735, Cl. 200-5.00A.
Earnshaw Enterprises Ltd.: *See*—
Earnshaw, William Ferguson, 4,055,030, Cl. 52-86.000.
Earnshaw, William Ferguson, to Earnshaw Enterprises Ltd. Greenhouse. 4,055,030, Cl. 52-86.000.
Eastman Kodak Company: *See*—
Fearnside, William T., 4,055,848, Cl. 358-8.000.
Hickok, William Kelsey, 4,055,849, Cl. 360-77.000.
Holmes, Edmund Thompson; and Campbell, Gerald Allan, 4,055,429, Cl. 96-74.000.
Snoke, Roy Eugene; and Klein, Gerald Wayne, 4,055,469, Cl. 195-66.00R.
Eaton, Bradley: *See*—
Hunts, Barney D.; Hare, George H.; and Eaton, Bradley, 4,055,129, Cl. 112-158.00E.
Ebco Industries, Ltd.: *See*—
Jensen, Olav V., 4,055,747, Cl. 235-61.11E.
Ecodyne Corporation: *See*—
Schwinn, Joseph Michael, 4,055,305, Cl. 239-524.000.
Edwards, Dale: *See*—
Gunzner, Fred G.; Edwards, Dale; and Lanning, John A., 4,055,204, Cl. 144-238.000.
Ehmann, William J., to SCM Corporation. Process for the oxidation of primary allylic alcohols. 4,055,601, Cl. 260-593.00R.
Eisenman, Leonard J. Bulk bed. 4,055,265, Cl. 214-17.00D.
Electronic Engineering Co. of California: *See*—
Beck, Herbert C., 4,055,738, Cl. 200-296.000.
Huntress, Charles B., 4,055,233, Cl. 181-135.000.
Eleving, Claes T., executor: *See*—
Elfving, Thore M., deceased; Eleving, Claes T., executor; and Elfving, Sven T., 4,055,053, Cl. 62-3.000.
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Elfving, Thore M., deceased; by Eleving, Claes T., executor; and Elfving, Sven T. Thermoelectric water cooler or ice freezer. 4,055,053, Cl. 62-3.000.
Elion, Glenn R.; and Klink, Arthur E., to Merck & Co., Inc. Catalyst for preparation of 4-cyanothiazole. 4,055,511, Cl. 252-435.000.
Elion, Glenn R.; and Klink, Arthur E., to Merck & Co., Inc. Catalyst for preparation of 4-cyanothiazole. 4,055,514, Cl. 252-470.000.
Elsas, Floyd O. Rope pulling device. 4,055,290, Cl. 226-128.000.
Elsie Manufacturing Company: *See*—
Ruegsegger, Donald Ray, 4,055,829, Cl. 337-416.000.
Emerson Electric Co.: *See*—
Roberts, Arnold E.; and Harshman, Jack D., 4,055,116, Cl. 101-79.000.
Emerson, Jack L.: *See*—
Slonaker, Robert O.; and Emerson, Jack L., 4,055,406, Cl. 65-11.00W.
Emmenegger, Karl: *See*—
Koller, Stefan; Pacher, Mariclise; and Emmenegger, Karl, 4,055,392, Cl. 8-21.00C.
Emmett, Robert C., Jr., to Envirotech Corporation. Thickening device and method. 4,055,494, Cl. 210-49.000.
En, John, to Motorola, Inc. One-error correction convolutional coding system. 4,055,832, Cl. 340-146.1AQ.
Ender, Hans-Georg: *See*—
Ender, Josef; and Ender, Hans-Georg, 4,055,172, Cl. 128-92.0BC.
Ender, Josef; and Ender, Hans-Georg. Nail and set for correctly resetting fractured bones for their immediate re-use. 4,055,172, Cl. 128-92.0BC.
Engelhard, William E., to Owego Heat Treat, Inc. Apparatus for heat treating work. 4,055,333, Cl. 266-130.000.
Engels, Walter, to Milliken Research Corporation. Apparatus to manufacture a cut loop pile fabric having an improved selvedge detector and guide. 4,054,974, Cl. 26-9.000.
Envirotech Corporation: *See*—
Emmett, Robert C., Jr., 4,055,494, Cl. 210-49.000.
Epoch Co., Ltd.: *See*—
Matsumoto, Teruo, 4,055,342, Cl. 273-88.000.

Erb, Charles G.: *See—*
Jasperson, Robert E.; Erb, Charles G.; Haber, Donald F.; and Pouring, Andrew A., 4,055,121, Cl. 102-14.000.

Erickson, Randall L.; and Bailey, Terry R., to Minnesota Mining and Manufacturing Company. Magnetically orientable retroreflectorization particles. 4,055,377, Cl. 350-105.000.

Erlemann, Gustav: *See—*
Brenner, Wolf; Erlemann, Gustav; and Pauling, Horst, 4,055,634, Cl. 424-47.000.

Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, to SKF Industrial Trading and Development Company, B.V. Ball bearing having staggered balls. 4,055,371, Cl. 308-201.000.

Eschle, Karl: *See—*
Huber-Emden, Helmut; Eschle, Karl; and Maeder, Arthur, 4,055,599, Cl. 260-562.00S.

Esdale, William J.: *See—*
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Essex Group, Inc.: *See—*
Vogel, Ralph A., 4,055,212, Cl. 164-4.000.

Essex International, Inc.: *See—*
Pops, Horace, 4,055,445, Cl. 148-11.50C.

Ethyl Corporation: *See—*
Marsee, Frederick J., 4,055,158, Cl. 123-119.00A.

Evans, John F.: *See—*
Pike, Harold L.; Thomas, G. Lamar; Ketchum, Ronald L.; and Evans, John F., 4,055,801, Cl. 324-73.00R.

Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. Uses of α-oxy(oxo) sulfides and ethers in foodstuffs and flavors for foodstuffs. 4,055,691, Cl. 426-534.000.

Evers, William John, to International Flavors & Fragrances Inc. Certain furan-3-thiols, certain dihydro derivatives thereof and 2,5-dimethyltetrahydrofuran-3-thiol. 4,055,578, Cl. 260-347.200.

Ewald, Nis-Friedrich; and Augustin, Hans-Georg, to Wilhelm Hegenscheidt GmbH. Combined precision boring and burnishing tool. 4,054,976, Cl. 29-90.00R.

Ewen, James H., Jr.: *See—*
Carleton, Peter S.; Ewen, James H., Jr.; and Reymore, Harold E., Jr., 4,055,548, Cl. 260-77.5AT.

Exxon Production Research Company: *See—*
Metge, Michel, 4,055,052, Cl. 61-103.000.

Exxon Research & Engineering Co.: *See—*
Blaser, Don E.; and Molstedt, Byron V., 4,055,484, Cl. 208-127.000.
Forster, Eric O.; and Creighton, Peter J., 4,055,001, Cl. 34-1.000.
Mertzweiller, Joseph K.; and Bearden, Roby, Jr., 4,055,483, Cl. 208-213.000.
Robson, Harry E., 4,055,482, Cl. 208-111.000.
Vandling, John M., 4,055,729, Cl. 179-2.00C.
Wheelock, Kenneth S., 4,055,513, Cl. 252-462.000.

Fahey, Darryl R., to Phillips Petroleum Company. Synthesis of nickel and palladium organophosphorus complexes. 4,055,582, Cl. 260-439.00R.

Fahimian, John; and Hare, Clive H. Typing correction paper. 4,055,704, Cl. 428-411.000.

Falkenstein, Don I.: *See—*
Holsinger, Jerry L.; Williams, David E.; Lezotte, Frank B.; and Falkenstein, Don I., 4,055,733, Cl. 179-175.30R.
Holsinger, Jerry L.; Lyon, David L.; Williams, David E.; Lezotte, Frank B.; and Falkenstein, Don I., 4,055,808, Cl. 325-67.000.

Farr, Emory W.; and Greene, Robert D. Torquing apparatus. 4,055,080, Cl. 73-139.000.

Faugeras, Pierre; Lecoq, Pierre; Miquel, Pierre; Rouyer, Hubert; and Simonet, Guy, to Commissariat a l'Energie Atomique. Method of treatment of a mixture of air and at least partially radioactive rare gases. 4,055,625, Cl. 423-262.000.

Fearnside, William T., to Eastman Kodak Company. Signal processing for off-air video recorder. 4,055,848, Cl. 358-8.000.

Fegley, Charles R.; and Johnson, Anderson F., Jr. Fluid dispensing anti-burglary device. 4,055,277, Cl. 222-5.000.

Feichtinger, Hans; Payer, Wolfgang; Cornils, Boy; and Weber, Jurgen, to Ruhrchemie Aktiengesellschaft. Process for the manufacture of bis-(2-cyanoethyl)-amine. 4,055,586, Cl. 260-465.50R.

Feisel, Armin: *See—*
Gramespacher, Herbert; and Feisel, Armin, 4,055,095, Cl. 82-36.00A.

Feneberg, Paul; and Krekeler, Ulrich, to Agfa-Gevaert Aktiengesellschaft. Silicone contact lens with hydrophilic surface treatment. 4,055,378, Cl. 351-160.000.

Fex, Hans: *See—*
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,055,638, Cl. 424-219.000.

Fiberite Corporation: *See—*
Schmanski, Donald W., 4,055,697, Cl. 428-113.000.

Fiedler, Helmut, to Siemens Aktiengesellschaft. Transmission circuit for direct current data transmission. 4,055,775, Cl. 307-254.000.

Fielding, Ivor R.: *See—*
Poppe, Wassily; and Fielding, Ivor R., 4,055,530, Cl. 260-29.6RW.

Finike Italiana Marposs Soc. In Accomandita Semplice di Mario Possati & C.: *See—*
Freddi, Tomaso, 4,055,027, Cl. 51-238.0GG.

Finkle, Bernard J.: *See—*
Popper, Karel; Schultz, William G.; Camirand, Wayne M.; Hautala, Earl; Robertson, George H.; Crawford, Ladell; and Finkle, Bernard J., 4,055,675, Cl. 426-470.000.

Finney, James Lee, to United States of America, Interior. Unitary drill bit and roof bolt. 4,055,051, Cl. 61-45.00B.

Firsov, Vladimir Nikolaevich: *See—*
Bykhovsky, David Grigorievich; Medvedev, Alexandr Yakovlevich; Bogorodsky, Jury Alexandrovich; Firsov, Vladimir Nikolaevich; and Rossomakho, Yakov Vulfovich, 4,055,741, Cl. 219-121.00P.

Fischer, Hanspeter, to Ciba-Geigy Corporation. Agents for inhibiting plant growth. 4,055,411, Cl. 71-92.000.

Fisher, Howard M., to Pennsylvania Engineering Corporation. Transformation of top-blown steel converter vessel to bottom-blown type. 4,055,335, Cl. 266-245.000.

Fisher, John F.: *See—*
Holmes, Donald E.; Howard, Wayne R.; Fisher, John F.; and Zeller, Burton S., 4,055,228, Cl. 180-14.00B.

Fisk, Charles S.; and Jung, Dietrich, to Jung, Dietrich. Test clip for electronic chips. 4,055,800, Cl. 324-72.500.

Fisons Limited: *See—*
Cairns, Hugh; Chambers, Albert; and Lee, Thomas Brian, 4,055,654, Cl. 424-283.000.

Fitzky, Hans Georg: *See—*
Bayer, Gunther; Fitzky, Hans Georg; Hoyer, Herbert; Luttgens, Gunter; and Muller-Bardorff, Wolfgang, 4,055,685, Cl. 96-87.00R.

Flamme, Bruno: *See—*
Bussmann, Egon; Flamme, Bruno; Vanhumbeeck, Jacky; Helder, Johannes; and De Steur, Hubert, 4,055,751, Cl. 364-500.000.

Flanders Filters, Inc.: *See—*
Allan, Thomas T.; and Wilcox, David E., 4,055,075, Cl. 73-40.700.

Fleming, Phillip F.; and Campbell, Steven J., to Gehl Company. Adjustable cutter bar support. 4,055,309, Cl. 241-221.000.

Foote, Lawrence R., to Ford Motor Company. Electrical control system for an exhaust gas sensor. 4,055,792, Cl. 323-19.000.

Forbes, Eric Simon: *See—*
Battersby, John; Forbes, Eric Simon; and Reid, Angus Joseph Dickson, 4,055,402, Cl. 44-58.000.

Ford Motor Company: *See—*
Foote, Lawrence R., 4,055,792, Cl. 323-19.000.
McWethy, Irvin E., 4,055,359, Cl. 285-39.000.

FORGEAL, Societe pour le Forgeage et l'Estampage des Alliages Legers: *See—*
Lucas, Roger; and Auberger, Jacques, 4,055,068, Cl. 72-356.000.

Forgeng, William D.: *See—*
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Forlenza, Nicholas G., to Mateflex/Mele Corporation. Construction method. 4,054,987, Cl. 29-452.000.

Formax, Inc.: *See—*
Sandberg, Glenn A.; Richards, Louis R.; and Stoub, James W., 4,054,967, Cl. 17-32.000.

Forster, Eric O.; and Creighton, Peter J., to Exxon Research & Engineering Co. Microwave drying process for synthetic polymers. 4,055,001, Cl. 34-1.000.

Fortune, William S. Electrically heated soldering-desoldering instruments. 4,055,744, Cl. 219-239.000.

Foseco Trading A.G.: *See—*
Massin, Daniel Maurice, 4,055,336, Cl. 266-283.000.

Fost, Dennis Lynn: *See—*
Bellina, Russell Frank; and Fost, Dennis Lynn, 4,055,661, Cl. 424-311.000.

Foulkes, Peter H., to Quaker Oats Company, The. Replacement of sugar in a sugar-containing food and process. 4,055,676, Cl. 426-532.000.

Fowler, John Rayford; and Hogan, Edward Merrick, to Du Pont de Nemours, E. I., and Company. Expansible fabric for fluid dispensing application. 4,055,201, Cl. 139-421.000.

Fox Valley Marking Systems, Inc.: *See—*
Smrt, Thomas J., 4,055,146, Cl. 119-51.110.

Frank, Wilhelm, to Wilh. Frank GmbH. Roof window arrangement. 4,055,024, Cl. 49-153.000.

Franz, Joseph Phillip, to General Electric Company. Resiliently supported windings in an electrical reactor. 4,055,826, Cl. 336-100.000.

Frazier, William C., to MacMillan Bloedel Limited. Method and apparatus for determining the wet strength of paper. 4,055,071, Cl. 73-12.000.

Freddi, Tomaso, to Finike Italiana Marposs Soc. In Accomandita Semplice di Mario Possati & C. Method and relative device for checking the working conditions during the grinding in centerless grinders. 4,055,027, Cl. 51-238.0GG.

Fredholm, Bo: *See—*
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,055,638, Cl. 424-219.000.

Freeman, James W., to Naylor, Neal & Uilkema, a part interest. Freight handling method. 4,055,263, Cl. 214-152.000.

Freeman, John W.; Jones, Thomas M.; and Reagan, Harold D., to ACF Industries, Incorporated. Method for repair of valves. 4,054,978, Cl. 29-157.10R.

French, Park, to Sterndent Corporation. Single adjustment multiple function calibration circuit. 4,055,813, Cl. 330-103.000.

French, Richard W.: *See—*
D'Antonio, Nicholas F.; Bates, Richard L.; and French, Richard W., 4,055,078, Cl. 73-88.50R.

Freshcorn, Ivan Gene, to United Aircraft Products, Inc. Method of preparing nickel alloy parts for plating. 4,055,472, Cl. 204-32.00R.

Frey, Kenneth H., to Byrne, Edward A.; Byrne, Gladys U.; Morrison,

Robert B.; and Morrison, Patricia A., part interest to each. Variable output fluid pump/motor. 4,055,106, Cl. 91-495.000.
Fridlund, Gosta; and Jiveman, Jan. Micro film storing device. 4,055,010, Cl. 40-124.000.
Friedemann, Wolfgang: *See*—
Christophliemk, Peter; Friedemann, Wolfgang; Vaeth, Ernst; and Worms, Karl-Heinz, 4,055,622, Cl. 423-118.000.
Friedman, Stephen B.; and Linnecke, Carl B., to Akzona Incorporated. Diagnostic test card. 4,055,394, Cl. 23-253.0TP.
Friedrich, Richard A.; and MacNeill, Robert L., to National Medical Care, Inc. Dialysis apparatus. 4,055,496, Cl. 210-87.000.
Fuchs, Werner Karl Heinz. Sensor. 4,055,090, Cl. 73-510.000.
Fuji Photo Film Co., Ltd.: *See*—
Hasegawa, Eiichi; and Yazawa, Kenichiro, 4,055,430, Cl. 96-90.00R.
Koyama, Koichi; Maekawa, Yukio; and Miyakawa, Masami, 4,055,428, Cl. 96-73.000.
Masuda, Takao; and Adachi, Keiichi, 4,055,432, Cl. 96-114.100.
Ogawa, Junkichi; Ishii, Tsumoru; and Shimamura, Isao, 4,055,426, Cl. 96-66.400.
Fujikura, Masakuni; and Abe, Naohiro, to Daido Seiko Kabushiki Kaisha. Ferrite-austenite stainless steel. 4,055,448, Cl. 148-38.000.
Fujimoto, Kazumi: *See*—
Tozawa, Keizaburo; Amatsu, Hideo; Takahashi, Shinichiro; Fujimoto, Kazumi; and Ikeda, Kishio, 4,055,372, Cl. 312-15.000.
Fujisawa, Masao; Makise, Mitsugu; and Kadono, Mamoru, to Bridgestone Tire Company Limited. Multi-cell gas-filled bag and method for producing the same. 4,055,136, Cl. 114-219.000.
Fujita, Hisashi: *See*—
Masuzima, Sho; Takahashi, Tetsuo; Taguchi, Yoshinobu; and Fujita, Hisashi, 4,054,988, Cl. 29-564.600.
Fujita, Shigemi; and Goto, Masaru, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing granular sorbic acid. 4,055,618, Cl. 264-141.000.
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Watanabe, Yasuaki; Okabe, Yukio; Hayakawa, Mitsuru; Ikemura, Yuichi; Fujita, Yasuhiro; and Murakami, Daisuke, 4,055,817, Cl. 331-117.00R.
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Katoh, Tadayoshi, 4,055,727, Cl. 178-68.000.
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Futamura, Kazumasa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Port liner support device. 4,055,045, Cl. 60-322.000.
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Konishi, Masami; and Futamura, Kazumasa, 4,055,043, Cl. 60-282.000.
G. D. Searle & Co.: *See*—
Meyer, Rolf; and Martin, Manuel I., 4,055,396, Cl. 23-259.000.
Gabel, Robert K.; and Seitz, Paul L., to Nalco Chemical Company. Formulation and application of alkaline zinc chloride compositions and detackification of paint spray booth wastes. 4,055,495, Cl. 210-52.000.
Gachot, Jean. Butterfly valve. 4,055,323, Cl. 251-306.000.
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Mustacchi, Henry, 4,055,425, Cl. 96-49.000.
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Wessely, Eugene, 4,055,133, Cl. 113-120.00Y.
Galmiche, Philippe M.; and Lepetit, Pierre J., to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Processes for protecting refractory metallic components against corrosion. 4,055,706, Cl. 428-652.000.
Gander, Robert J.; and Gurney, John A., to Johnson & Johnson. Retinoic acid derivatives. 4,055,659, Cl. 424-305.000.
Garcia-Kuenzli, Marcos. Table war game apparatus. 4,055,346, Cl. 273-131.0BB.
Garner, Robert; and Petitpierre, Jean Claude, to Ciba-Geigy Corporation. Nitro-phthalides, their manufacture and their use in recording systems. 4,055,358, Cl. 282-27.500.
Garrett, Buford C. Cam operated compression molding apparatus. 4,055,033, Cl. 53-122.000.
Gatland, Geoffrey H.; and Robitaille, Kenneth L., to Vemco Products, Inc. Door operator with instant reverse feature. 4,055,023, Cl. 49-28.000.
Gay, Michael J., to Motorola, Inc. Tone control circuit. 4,055,818, Cl. 333-28.00T.
Gebr. Hofmann KG, Maschinenfabrik: *See*—
Honlinger, Herwig, 4,055,081, Cl. 73-146.000.
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Gehl Company: *See*—
Fleming, Phillip F.; and Campbell, Steven J., 4,055,309, Cl. 241-221.000.
Gehring, Thilo; and Berger, Heinz, to Robert Bosch G.m.b.H. Ignition distributor-breaker system having centrifugal timing adjustment. 4,055,157, Cl. 123-117.00R.
Geist, Thomas N.: *See*—
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Cunningham, Eldon R., 4,055,370, Cl. 308-36.100.
DiMarzio, Alfred W., 4,055,786, Cl. 318-562.000.
Franz, Joseph Phillip, 4,055,826, Cl. 336-100.000.
Menke, Curtis M., 4,055,094, Cl. 82-1.00C.
Georg Fischer Aktiengesellschaft: *See*—
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Delarge, Jacques E.; Lapiere, Charles L.; and Georges, Andre H., 4,055,650, Cl. 424-263.000.
Gerber, Arthur H., to Horizons Incorporated, a division of Horizons Research Incorporated. Upgraded aromatic polyester material in powder form. 4,055,534, Cl. 260-45.7PH.
Gerber, Mark S.; and Miller, Don W., to Ohio State University, The. Gamma camera system with composite solid state detector. 4,055,765, Cl. 250-370.000.
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Gerding, James H.; and Heyman, Albert M., to Honeywell Information Systems Inc. Power supply with base drive control. 4,055,790, Cl. 363-24.000.
Gesellschaft fur Kernforschung m.b.H.: *See*—
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Gewako S.A.: *See*—
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Ghetti, Giuseppe: *See*—
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Beadle, Bruce R.; and Olig, Eugene A., 4,055,787, Cl. 318-591.000.
Plummer, Harvey R., 4,054,977, Cl. 407-108.000.
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Martinez, Daniel G., 4,055,341, Cl. 273-86.00C.
Gillette Company, The: *See*—
Greeley, William Hancock, Jr., 4,055,788, Cl. 318-624.000.
Goebel, Hermann, to Bayer Aktiengesellschaft. Tetrakisazo dyestuffs. 4,055,558, Cl. 260-166.000.
Golden State Helicopter, Inc.: *See*—
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Goldstein, Gideon, to Sloan-Kettering Institute for Cancer Research. Immunoassay for thymopoietin. 4,055,633, Cl. 424-1.000.
Golius, Tamara Efimovna: *See*—
Pavlushkin, Nikolai Mikheevich; Bondarev, Konstantin Timofeevich; Strekalov, Anatoly Vasilievich; Kozlovsky, Viktor Stepanovich; Minakov, Anatoly Gavrilovich; Golius, Tamara Efimovna; Orlova, Ljudmila Alexeevna; Sarkisov, Pavel Dzhibraelovich; Kozmin, Mikhail Ivanovich; and Minakov, Vladimir Anatolievich, 4,055,436, Cl. 106-52.000.
Gontar, Herbert. Retainable tab construction for sealed cans. 4,055,275, Cl. 220-269.000.
Gonzalez, Ed. Solar energy collector. 4,055,162, Cl. 126-271.000.
Goodenough, David John; Weaver, Kenneth E.; Smrcka, Joseph G.; and Clayman, William, to Alderson Research Laboratories, Inc. Test body for a scanning tomographic analytical apparatus. 4,055,771, Cl. 250-505.000.
Goodfellow, Anthony Gerald, to Dunlop Limited. Tire manufacture. 4,055,619, Cl. 264-258.000.
Goodwin, Joseph E. Unitary club retainer for golf bags. 4,055,207, Cl. 150-1.50R.
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Gottfried Bischoff Bau Kompl. Gasreinigungs und Wasserruckkuhlanlagen Kommanditgessellschaft: *See*—
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Graff, Theodore S.: *See*—
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Graham, Robert H., to R. A. Pearson Co. Flap laminating mechanism for carton blanks. 4,055,110, Cl. 93-49.00R.
Gramespacher, Herbert; and Feisel, Armin, to Georg Fischer Aktiengesellschaft. Tool changing device for a lathe. 4,055,095, Cl. 82-36.00A.
Gravestock, Michael B.: *See*—
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Yakshin, Alexandr Sergeevich; Novikov, Oleg Nikolaevich; Grechinsky, Dmitry Alexeevich; Klochkb, Viktor Alexandrovich; and Rygalin, Viktor Georgiевich, 4,055,842, Cl. 340-347.0AD.
Greeley, William Hancock, Jr., to Gillette Company, The. Motor control circuit. 4,055,788, Cl. 318-624.000.

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Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Kawanee Industries. Method of preparing capped polymers. 4,055,712, Cl. 526-11.100.
Green, Joseph; and Cawthorne, Michael Anthony, to Beecham Group Limited. Fibrinolytic compositions. 4,055,635, Cl. 424-78.000.
Greene, James Albert. In-case bottle filling apparatus. 4,055,202, Cl. 141-59.000.
Greene, Robert D.: *See—*
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Greiss, Rashad S., to Boeing Company, The. Aft main deck split level galley. 4,055,317, Cl. 244-118.00P.
Griffin, Carl W. Composite shop trailer. 4,055,206, Cl. 144-285.000.
Grisar, J. Martin; Claxton, George P.; and MacKenzie, Robert D., to Richardson-Merrell Inc. α-Alkylbenzyl lactamimides. 4,055,561, Cl. 260-239.00B.
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Anselment, Wolfgang; and Gritschmeier, Walter, 4,055,503, Cl. 252-12.000.
Grossman, Milton J. Knife and bread board attachment. 4,054,994, Cl. 30-296.00R.
Gruber, Wilhelm; and Schroeder, Guenter, to Rohm GmbH. Method of making carboxylic acid esters. 4,055,590, Cl. 560-179.000.
Grunwell, Joyce Francis: *See—*
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Schreurs, Willy P., 4,055,781, Cl. 313-487.000.
Guadalupi, Mario. Process for treating gases in the ammonia synthesis. 4,055,627, Cl. 423-359.000.
Gulf Oil Corporation: *See—*
Muldrow, Barney P., Jr., 4,055,122, Cl. 102-23.000.
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Gunzner, Fred G.; Edwards, Dale; and Lanning, John A., to Lifetime Carbide Company. Adjustable wobble dado assembly having improved dynamic balance. 4,055,204, Cl. 144-238.000.
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Gusarov, Anatoly Alexandrovich; and Shatalov, Lev Nixolaevich. Method of balancing r tors. 4,055,683, Cl. 427-8.000.
Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., to M & T Chemicals Inc. Additive-containing fibers. 4,055,702, Cl. 428-398.000.
Gvelesiani, Konstantin Shalvovich; Kadzhelashvili, Zauri Mikhailovich; Tskvitinidze, Alexandr Shalvovich; Tusishvili, Otari Shalvovich; Sherezadashvili, Andrei Illarionovich; Khabuliani, Gamlet Varlamovich; Bakhanova, Lia Nakhshonovna; and Tatishvili, Otari Vardenovich. Device for pipeline transportation of loads by fluid flow. 4,055,315, Cl. 243-33.000.
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Mathieu, Serge, 4,055,795, Cl. 323-102.000.
Haas, Rudy M. Chemical tracer method of and structure for determination of instantaneous and total mass and volume fluid flow. 4,055,083, Cl. 73-194.00E.
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Habermehl, Diethard: *See—*
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Habler, Adam L. Holder for a smoking-pipe. 4,055,283, Cl. 224-5.00R.
Hadgraft, Robert B.; and Martin, John J., to Reichhold Chemicals, Inc. Starch latex composition. 4,055,694, Cl. 428-95.000.
Hagedorn, Hans. Package stacking method and apparatus. 4,055,256, Cl. 214-6.0DK.
Haiges, Adolf, to Suevia Haiges KG, Firma. Neck frame for cattle. 4,055,149, Cl. 119-147.00A.
Hall, Harold H., Jr.: *See—*
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Hammond, Grover M., to Leisure Manufacturing Co., Inc. Scissors jack. 4,055,329, Cl. 254-86.00R.
Hammond, Michael George Ridler, to A.C.I. Operations Pty. Ltd. Process for forming sealed liquid filled bags. 4,055,032, Cl. 53-14.000.
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Casey, Thomas P.; Hansen, Howard A.; Klett, Gene R.; and Olthoff, James A., 4,055,223, Cl. 172-777.000.
Hara, Hideo, to Kabushiki Kaisha Komatsu Seisakusho. Safety device for hydraulically driven vehicles. 4,055,047, Cl. 60-444.000.
Haraikawa, Tetsuo; and Ito, Hiroshi, to Tokico Ltd. Anti-squeal device in disc brake. 4,055,238, Cl. 188-73.500.
Harbottle, William E., to Timken Company, The. Adjusting process for bearings. 4,054,999, Cl. 33-181.0AT.
Harden, Jerrell W.: *See—*
Brown, Ronald P.; and Harden, Jerrell W., 4,055,126, Cl. 111-85.000.
Hardtmann, Goetz E.; and Coppola, Gary M., to Sandoz, Inc. 5-Substituted-6H[1]-benzopyrano[3,2-c][1,8]naphthyridine-6,7-(6H)-diones. 4,055,566, Cl. 260-295.00A.
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Harrigan, Roy M. Drug delivery device for preventing contact of undissolved drug with the stomach lining. 4,055,178, Cl. 128-260.000.
Harshaw Chemical Company, The: *See—*
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Wagers, Robert S.; and Hartmann, Clinton S., 4,055,821, Cl. 333-70.00T.
Harvey, Edward Henry. Constructional toy and element therefor. 4,055,019, Cl. 46-30.000.
Hasegawa, Eiichi; and Yazawa, Kenichiro, to Fuji Photo Film Co., Ltd. Light sensitive material containing an ethylene compound dye former, an organic polymer compound containing chlorine and a plasticizer. 4,055,430, Cl. 96-90.00R.
Hasegawa, Seitaro: *See—*
Hasegawa, Tsuneo; and Hasegawa, Seitaro, 4,055,490, Cl. 210-17.000.
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Haskell, Theodore Herbert: *See—*
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Hattler, Louis R.; and Menon, Sukumaran K., to Xerox Corporation. Release material application seal. 4,055,143, Cl. 118-60.000.
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Havlik, Vaclav. Game apparatus. 4,055,345, Cl. 273-131.0AC.
Hay, Harold R. Process and apparatus for solar distillation. 4,055,473, Cl. 202-234.000.
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Hayden, Thomas John. Keyboard switch assembly with hinged push-buttons and cantilevered terminal members. 4,055,734, Cl. 200-5.00A.
Haydock, David Bryan; Mulholland, Thomas Patrick Cunningham; and Thorp, Jeffrey Meyrick, to Imperial Chemical Industries Limited. Substituted aryloxy-3,3,3-trifluoro-2-propionic acids, esters and salts thereof. 4,055,595, Cl. 260-520.00B.
Hayward, Glenn L., to Leesona Corporation. Die construction. 4,055,389, Cl. 425-466.000.
Hegemann, Karl-Rudolf, to Gottfried Bischoff Bau Kompl. Gasreinigungs und Wasserruckkuhlanlagen Kommanditgessellschaft. Method of cleaning stack gas and using same for generation of electric power. 4,055,331, Cl. 266-44.000.
Heidelberg, Gotz. Systems for magnetically supporting a vehicle. 4,055,123, Cl. 104-148.0LM.
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Heithoff, Robert B.; and Pecoraro, George A., to PPG Industries, Inc. Apparatus for the manufacture of flat glass having a glass refractory delivery piece and method of installation. 4,055,407, Cl. 65-27.000.
Helder, Johannes: *See—*
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Helmstetter, Gerald J., to National Starch and Chemical Corporation. Gel strength enhancer for gelatin compositions including an oxidized polysaccharide. 4,055,554, Cl. 260-117.000.

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Heumann, Heinz; Saure, Manfred; Wagner, Heinz; and Wartusch, Johann, to Licentia Patent-Verwaltungs-G.m.b.H.; and Aeg-Telefunken Kabelwerke Aktiengesellschaft. Stabilizer in a high voltage insulation on a polyolefin base. 4,055,504, Cl. 252-63.200.
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Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,055,636, Cl. 424-177.000.
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Hirose, Kiyonobu; Ishida, Shuichi; and Omori, Kaoru, to Nippon Kayaku Kabushiki Kaisha. Derivatives of N-(2,2-dichlorovinyl) salicylamide and use thereof as bactericides, fungicides and algicides for industry. 4,055,639, Cl. 424-230.000.
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Ho, Irving T.; and Riseman, Jacob, to International Business Machines Corporation. High reliability, low leakage, self-aligned silicon gate FET and method of fabricating same. 4,054,989, Cl. 29-571.000.
Hobart Corporation: *See*—
Boshinski, Edwin E.; Meckstroth, Robert C.; and Rogers, Robert M., 4,055,748, Cl. 364-466.000.
Rogers, Robert M.; and Boshinski, Edwin E., 4,055,753, Cl. 364-466.000.
Hochiki Corporation: *See*—
Takeuchi, Takeshi; and Takahashi, Mitsuo, 4,055,809, Cl. 325-308.000.
Hodogaya Chemical Co., Ltd.: *See*—
Yoshida, Hiroyuki; and Saga, Katumi, 4,055,624, Cl. 423-235.000.
Hoechst Aktiengesellschaft: *See*—
Bock, Jurgen; and Strutz, Hans-Jurgen, 4,055,311, Cl. 242-18.0DD.
Hoechst, Lonnie D.: *See*—
Bauer, James J.; Albright, Larry E.; Werner, James L.; Sagaser, Thomas M.; and Hoechst, Lonnie D., 4,055,262, Cl. 214-140.000.
Hoffman, Robert T.; and Buecher, Roger W., to United States of America, Navy. Controllable gas generator. 4,055,632, Cl. 423-657.000.
Hoffmann, Hellmut; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. O-[1-Alkyl-5-substituted-mercapto-triazol(3)yl]-phosphoric(phosphonic) acid esters and ester-amides. 4,055,571, Cl. 260-308.00R.
Hoffmann-La Roche, Inc.: *See*—
Brenner, Wolf; Erlemann, Gustav; and Pauling, Horst, 4,055,634, Cl. 424-47.000.
Hogan, Edward Merrick: *See*—
Fowler, John Rayford; and Hogan, Edward Merrick, 4,055,201, Cl. 139-421.000.
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, to Aktiebolaget Leo. Novel compounds, compositions containing such compounds, processes for their preparation and methods of treatment. 4,055,638, Cl. 424-219.000.
Holden, Herbert K.; and Mansfield, Peter W., to American Filtrona Corporation. Crimper assembly. 4,055,108, Cl. 93-1.00C.
Holderman, Louis B.: *See*—
United States of America, National Aeronautics and Space Administration; Holderman, Louis B.; and Peters, Palmer N., 4,055,847, Cl. 357-5.000.
Holland Company: *See*—
Chierici, Osvaldo F.; and Murphy, Richard F., 4,055,254, Cl. 213-61.000.
Holland Mechanics B.V.: *See*—
Damman, Cornelis Christiaan, 4,054,982, Cl. 29-159.100.
Hollingsworth, Charles M.: *See*—
Kosicki, Witold W.; and Hollingsworth, Charles M., 4,055,020, Cl. 46-161.000.
Hollis Engineering, Inc.: *See*—
Boynton, Kenneth G., 4,055,725, Cl. 174-68.500.
Holmes, Donald E.; Howard, Wayne R.; Fisher, John F.; and Zeller, Burton S., to Clark Equipment Company. Drive line disconnect mechanism. 4,055,228, Cl. 180-14.00B.
Holmes, Edmund Thompson; and Campbell, Gerald Allan, to Eastman Kodak Company. Inhibitor barrier layers for photographic materials. 4,055,429, Cl. 96-74.000.
Holsinger, Jerry L.; Williams, David E.; Lezotte, Frank B.; and Falkenstein, Don I., to Intertel, Inc. Line level signal measuring device. 4,055,733, Cl. 179-175.30R.
Holsinger, Jerry L.; Lyon, David L.; Williams, David E.; Lezotte, Frank B.; and Falkenstein, Don I., to Intertel, Inc. Data communications network testing system. 4,055,808, Cl. 325-67.000.
Homs, Douglas M. Transparent dial and outer transparent cover for scale with zero-setting adjustment. 4,055,141, Cl. 116-129.00F.
Honeywell Information Systems Inc.: *See*—
Eachus, Joseph J.; and Graff, Theodore S., 4,055,735, Cl. 200-5.00A.
Gerding, James H.; and Heyman, Albert M., 4,055,790, Cl. 363-24.000.
Honkawa, Tadashi; Fukuda, Kenji; and Shimizu, Mikio, to Hitachi, Ltd. Analysis apparatus. 4,055,395, Cl. 23-253.00R.
Honlinger, Herwig, to Gebr. Hofmann KG, Maschinenfabrik. Method and apparatus for improving the ride characteristics of motor vehicle wheels. 4,055,081, Cl. 73-146.000.
Honna, Kosaku: *See*—
Kawata, Noboru; Honna, Kosaku; and Sugahara, Hirozo, 4,055,721, Cl. 560-207.000.
Hooker Chemicals & Plastics Corporation: *See*—
Hopkins, George C.; and Merrifield, D. Bruce, 4,055,581, Cl. 260-429.900.
Scharf, Daniel J., 4,055,591, Cl. 260-502.500.
Hopkins, George C.; and Merrifield, D. Bruce, to Hooker Chemicals & Plastics Corporation. Heat and light stabilizers for halogen containing polymeric resins. 4,055,581, Cl. 260-429.900.
Hopkins Manufacturing Corporation: *See*—
Mayhew, Theron T., 4,055,250, Cl. 206-457.000.
Horie, Kouji: *See*—
Numazawa, Akio; Nakamura, Hiroyuki; Kurita, Tokio; Horie, Kouji; and Kondo, Toshio, 4,055,237, Cl. 188-73.400.
Horizons Incorporated, a division of Horizons Research Incorporated: *See*—
Gerber, Arthur H., 4,055,534, Cl. 260-45.7PH.
Hornbostel, Lloyd H., Jr., to Beloit Management & Research Center. Detection system. 4,055,844, Cl. 340-420.000.
Horninger, Karlheinrich: *See*—
Stein, Karl-Ulrich; and Horninger, Karlheinrich, 4,055,837, Cl. 340-173.00R.
Horsman Dolls Inc.: *See*—
Kosicki, Witold W.; and Hollingsworth, Charles M., 4,055,020, Cl. 46-161.000.
Horwitz, Ludvig L. Thermosiphonic boiler. 4,055,055, Cl. 62-238.000.
Hosoya, Minoru, to Kao Soap Co., Ltd. Carton with integral separable measuring vessel. 4,055,292, Cl. 229-17.00M.

Hossfeld Manufacturing Co.: *See*—
Whetstone, Cecil, Jr.; and Burns, Anthony G., 4,055,065, Cl. 72-217.000.
Hotta, Seiji; and Akamatsu, Takashi, to Sumitomo Chemical Company, Limited. Optical brightening agents of naphthalimide derivatives. 4,055,565, Cl. 260-281.00N.
Houlihan, William J., to Sandoz, Inc. Hydroxyalkyl substituted-4,5-dihydropyridazin(2H)-3-ones. 4,055,644, Cl. 260-250.0AH.
Howard, Wayne R.: *See*—
Holmes, Donald E.; Howard, Wayne R.; Fisher, John F.; and Zeller, Burton S., 4,055,228, Cl. 180-14.00B.
Howatt, George F., to New England Envelope Manufacturing Co. Envelope machine. 4,055,111, Cl. 93-61.00R.
Hoya Glass Works, Ltd.: *See*—
Sagara, Hiroji, 4,055,435, Cl. 106-52.000.
Hoyer, Herbert: *See*—
Bayer, Gunther; Fitzky, Hans Georg; Hoyer, Herbert; Luttgens, Gunter; and Muller-Bardorff, Wolfgang, 4,055,685, Cl. 96-87.00R.
Hruby, John O., Jr., to Rain Jet Corporation. Shower head with divergent impact effect nozzle. 4,055,301, Cl. 239-101.000.
Hruby, John O., Jr., to Rain Jet Corporation. Liquid spray nozzle having a randomly directionally unstable discharge characteristic and counterflow internal flow pattern. 4,055,302, Cl. 239-102.000.
Hruby, John O., Jr., to Rain Jet Corporation. Liquid spray nozzle having a randomly directionally unstable discharge characteristic. 4,055,306, Cl. 239-601.000.
Hsiung, Du Yung, to Scholl, Inc. Cold insulating insole. 4,055,699, Cl. 428-311.000.
Hsu, Thomas C.; and Miller, John L., to Westvaco Corporation. Apparatus for forming a fiber oriented handsheet. 4,055,462, Cl. 162-382.000.
Huber-Emden, Helmut; Eschle, Karl; and Maeder, Arthur, to Ciba-Geigy Corporation. N-(Alkylhydrobenzyl)-alkylthio- and mercapto-acetamides. 4,055,599, Cl. 260-562.00S.
Hucks, Uwe; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Short glass fibers covered with polymeric materials. 4,055,611, Cl. 264-6.000.
Hudson, Ed D.; and Mallory, Merrit L., to United States of America, Energy Research and Development Administration. Method of enhancing cyclotron beam intensity. 4,055,782, Cl. 315-111.900.
Huff, Norman M.: *See*—
Stohrer, Charles E., Jr.; Huff, Norman M.; and Micinski, Leonard J., 4,055,132, Cl. 113-116.0EE.
Hughes, Alexander W., Jr. Resettable toy phonograph. 4,055,351, Cl. 274-15.00R.
Hughes, John F.; and Dalkin, Stanislaw. Plug valve assembly. 4,055,324, Cl. 251-309.000.
Hughes Tool Company: *See*—
Dyer, Billy F., 4,055,338, Cl. 267-125.000.
Millsapps, Stuart C., 4,055,225, Cl. 175-228.000.
Huhta-Koivisto, Esko; and Piironen, Pekka Elis. Methods and systems relating to undulating motion. 4,055,018, Cl. 43-42.480.
Huignard, Jean Pierre; and Micheron, Francois, to Thomson-CSF. Ferroelectric information optical storage device with self biasing. 4,055,838, Cl. 340-173.200.
Hunt, Archie F.; and Moss, Jack J. Golf putting practice device having mechanical calculators. 4,055,349, Cl. 273-179.00A.
Hunter, Leon; and Petty, Walter L., to Shell Oil Company. Poly(-cyanodifluoroamino ethers), their preparation and utilization. 4,055,516, Cl. 260-2.00A.
Huntress, Charles B., to Electronic Engineering Co. of California. Ear coupler. 4,055,233, Cl. 181-135.000.
Hunts, Barney D.; Hare, George H.; and Eaton, Bradley, to Singer Company, The. Digital differential capacitance proximity switch. 4,055,129, Cl. 112-158.00E.
Hurley, Joseph John, to J. & P. Coats Limited. Tank for holding liquid. 4,055,269, Cl. 220-10.000.
Husain, Igbal: *See*—
Yoli, Alfred H.; and Husain, Igbal, 4,055,508, Cl. 252-301.10W.
Hydrostress Aktiengesellschaft: *See*—
Bieri, Hans, 4,055,353, Cl. 279-2.00R.
Iannelli, Frank M., to Tannetics, Inc. Excess pressure relieving valve. 4,055,198, Cl. 137-116.500.
ICI Australia Limited: *See*—
Sujansky, Vladimir, 4,055,450, Cl. 149-60.000.
Ickes, Charles M.; and Perusse, Eugene T., to Rohr Industries, Incorporated. Base drive regulator. 4,055,794, Cl. 323-22.00T.
Idemitsu Kosan Company, Ltd.: *See*—
Kawata, Noboru; Honna, Kosaku; and Sugahara, Hirozo, 4,055,721, Cl. 560-207.000.
Ikari, Shinichi, to Kubota, Masao. Lead-acid storage battery. 4,055,711, Cl. 429-143.000.
Ikawa, Kazuo: *See*—
Ogawa, Naoki; and Ikawa, Kazuo, 4,055,375, Cl. 339-6.00R.
Ikeda, Kishio: *See*—
Tozawa, Keizaburo; Amatsu, Hideo; Takahashi, Shinichiro; Fujimoto, Kazumi; and Ikeda, Kishio, 4,055,372, Cl. 312-15.000.
Ikeda, Yasuo. Method of manufacturing electric resistors. 4,055,615, Cl. 264-105.000.
Ikemura, Yuichi: *See*—
Watanabe, Yasuaki; Okabe, Yukio; Hayakawa, Mitsuru; Ikemura, Yuichi; Fujita, Yasuhiro; and Murakami, Daisuke, 4,055,817, Cl. 331-117.00R.
Illinois Tool Works Inc.: *See*—
Blaul, John Joseph, 4,055,208, Cl. 151-37.000.
Imai, Takayoshi: *See*—
Tajima, Eiichi; Yamamoto, Kaname; and Imai, Takayoshi, 4,055,453, Cl. 156-279.000.
Imperial Chemical Industries Limited: *See*—
Haydock, David Bryan; Mulholland, Thomas Patrick Cunningham; and Thorp, Jeffrey Meyrick, 4,055,595, Cl. 260-520.00B.
Langley, Philip Edward; and Tulip, Robert, 4,055,600, Cl. 260-586.00P.
Last, Anthony Graham Marshall; and Rixon, John Albert, 4,055,695, Cl. 428-195.000.
Inbauproduct Innenausbausysteme GmbH & Co., KG: *See*—
Andresen, Peter B.; Winter, Claus; and Hendel, Siegfried H., 4,055,373, Cl. 312-263.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Conta, Renato; Montanari, Lucio; and Brescia, Riccardo, 4,055,743, Cl. 219-216.000.
Inmont Corporation: *See*—
Civardi, Frank Peter, 4,055,693, Cl. 428-91.000.
Inskeep, Mark D.: *See*—
Poppe, Wassily W.; and Inskeep, Mark D., 4,055,608, Cl. 260-857.00L.
International Business Machines: *See*—
Smith, Archibald W., 4,055,815, Cl. 331-94.50H.
International Business Machines Corporation: *See*—
Ho, Irving T.; and Riseman, Jacob, 4,054,989, Cl. 29-571.000.
Orlandi, John Victor; Poley, Neil Myron; and Wilson, Donald Miller, 4,055,219, Cl. 219-390.000.
International Computers Limited: *See*—
Munday, Basil Sidney, 4,055,117, Cl. 101-93.140.
International Flavors & Fragrances Inc.: *See*—
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,055,691, Cl. 426-534.000.
Evers, William John, 4,055,578, Cl. 260-347.200.
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,055,506, Cl. 252-132.000.
International Harvester Company: *See*—
Kestian, Anthony M.; and Allori, Raymond J., 4,055,230, Cl. 180-89.100.
International Telephone and Telegraph Corporation: *See*—
November, Milton H., 4,055,082, Cl. 73-194.00R.
Woskow, Robert M., 4,055,816, Cl. 331-32.000.
Intertel, Inc.: *See*—
Holsinger, Jerry L.; Williams, David E.; Lezotte, Frank B.; and Falkenstein, Don I., 4,055,733, Cl. 179-175.30R.
Holsinger, Jerry L.; Lyon, David L.; Williams, David E.; Lezotte, Frank B.; and Falkenstein, Don I., 4,055,808, Cl. 325-67.000.
Inui, Taiji: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Takamatsu, Akira; Inui, Taiji; Tone, Hiroshi; and Morishima, Hajime, 4,055,468, Cl. 195-29.000.
Inukai, Noriyoshi; Murakami, Masuo; Iwamoto, Hidenori; Yanagisawa, Isao; Tamura, Toshinari; Ishii, Yoshio; Tomioka, Kenichi; and Shiozaki, Tetsuya, deceased (by Shiozaki, Hiroko, legal representative), to Yamanouchi Pharmaceutical Co., Ltd. 20-Alkoxy-16-alkyl prostadienoic acid derivatives. 4,055,589, Cl. 560-121.000.
Ireco Chemicals: *See*—
Wasson, Daniel A., 4,055,449, Cl. 149-2.000.
Irie, Takefumi: *See*—
Okudaira, Shigenori; Takahashi, Mitsuo; Irie, Takefumi; Itoh, Eiji; and Kashiwagi, Koh, 4,055,621, Cl. 423-79.000.
Ishida, Shuichi: *See*—
Hirose, Kiyonobu; Ishida, Shuichi; and Omori, Kaoru, 4,055,639, Cl. 424-230.000.
Hirose, Kiyonobu; Ishida, Shuichi; and Omori, Kaoru, 4,055,640, Cl. 424-230.000.
Ishida, Torao; Shirai, Takashi; and Akiyama, Minoru, to Asahi Kasei Kogyo Kabushiki Kaisha. N^4Acyl-1-arabinofuranosylcytosine-5'-esters. 4,055,716, Cl. 536-23.000.
Ishida, Toshio: *See*—
Sakurai, Yasuhiko; Ishida, Toshio; and Kusumoto, Teruo, 4,055,831, Cl. 340-80.000.
Ishii, Tsumoru: *See*—
Ogawa, Junkichi; Ishii, Tsumoru; and Shimamura, Isao, 4,055,426, Cl. 96-66.400.
Ishii, Yoshio: *See*—
Inukai, Noriyoshi; Murakami, Masuo; Iwamoto, Hidenori; Yanagisawa, Isao; Tamura, Toshinari; Ishii, Yoshio; Tomioka, Kenichi; and Shiozaki, Tetsuya, deceased, 4,055,589, Cl. 560-121.000.
Ishikawa Tekko Kabushiki Kaisha: *See*—
Yamamoto, Mitsuo, 4,055,708, Cl. 429-10.000.
Isolerings Aktiebolaget Isenta: *See*—
Aleniusson, Sven Goran, 4,054,985, Cl. 29-416.000.
Isono, Atsuya: *See*—
Motai, Yoichi; Gouda, Keijiro; and Isono, Atsuya, 4,055,137, Cl. 114-230.000.
Ito, Hiroshi: *See*—
Haraikawa, Tetsuo; and Ito, Hiroshi, 4,055,238, Cl. 188-73.500.
Itoh, Eiji: *See*—
Okudaira, Shigenori; Takahashi, Mitsuo; Irie, Takefumi; Itoh, Eiji; and Kashiwagi, Koh, 4,055,621, Cl. 423-79.000.
Ivanov, Lev Nikolaevich: *See*—
Movshovich, Pavel Mikhailovich; Maximov, Gennady Konstantinovich; Khavkin, Viktor Pavlovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Afanasiev, Vladimir Konstan-

tinovich; Kudryavtseva, Tamara Nikolaevna; and Nezelenov, Sergei Vladimirovich, 4,055,039, Cl. 57-34.0AT.

Iwamoto, Hidenori: *See*—
Inukai, Noriyoshi; Murakami, Masuo; Iwamoto, Hidenori; Yanagisawa, Isao; Tamura, Toshinari; Ishii, Yoshio; Tomioka, Kenichi; and Shiozaki, Tetsuya, deceased, 4,055,589, Cl. 560-121.000.

J. & P. Coats Limited: *See*—
Hurley, Joseph John, 4,055,269, Cl. 220-10.000.

Jackson, Melvin R., to United States of America, National Aeronautics and Space Administration. Directionally solidified eutectic γ-γ' nickel-base superalloys. 4,055,447, Cl. 148-32.000.

Janke, Robert W. Wax applicator for skis. 4,054,962, Cl. 15-105.000.

Japan Exlan Company Limited: *See*—
Sawanishi, Shigeru; Ozaki, Masahiko; and Katagawa, Kikuji, 4,055,493, Cl. 210-31.00C.

Jarreau, Charles L., Sr., to Calumet Petrochemicals, Inc. Phenol alkylation. 4,055,605, Cl. 260-624.00R.

Jarvis, William Joseph, to Coal Industry (Patents) Limited. Longwall machine with captivating bracket. 4,055,367, Cl. 299-53.000.

Jasperson, Robert E.; Erb, Charles G.; Haber, Donald F.; and Pouring, Andrew A., to Trident Engineering Assoc., Inc. Depth controlled naval mine. 4,055,121, Cl. 102-14.000.

Jeffreys, George A.; Price, Jean L.; and Tobey, James F., to George A. Jeffreys & Co., Inc. Animal feed yeast supplement from dried whey yeast bran process. 4,055,666, Cl. 426-31.000.

Jellinek, Ernest, to RCA Corporation. Heading sensor for vehicle dead reckoning system. 4,055,750, Cl. 364-424.000.

Jenkins, Stephen R.; Northrup, Thomas A.; and Stewart, Robert E., to Digital Equipment Corporation. Memory module with means for generating a control signal that inhibits a subsequent overlapped memory cycle during a reading operation portion of a reading memory cycle. 4,055,851, Cl. 364-200.000.

Jensen, Olav V., to Ebco Industries, Ltd. Apparatus and method for the synchronous reading of data from a punched card. 4,055,747, Cl. 235-61.11E.

Jirus, Earl J.: *See*—
Beavon, David K.; and Jirus, Earl J., 4,055,401, Cl. 23-277.00C.

Jiveman, Jan: *See*—
Fridlund, Gosta; and Jiveman, Jan, 4,055,010, Cl. 40-124.000.

Johanns, Rudolph W. Animal breeding chart. 4,055,009, Cl. 40-107.000.

Johansson, Goran Karl Nils: *See*—
Sjostrand, Uno Roland; and Johansson, Goran Karl Nils, 4,055,035, Cl. 53-167.000.

Johns, Herman S., to Medical Specialties, Inc. Apparatus for molding a protective pad. 4,055,388, Cl. 425-4.00R.

Johns-Manville Corporation: *See*—
Chen, Alwin Bennett; and Pallo, John Matthew, 4,055,434, Cl. 106-50.000.
Zeller, Robert Dale; and Sullivan, Daryl Dean, 4,055,383, Cl. 356-229.000.

Johnson, Alexander L.; and Sweetser, Philip B., to Du Pont de Nemours, E. I., and Company. Pyrazole plant growth regulants. 4,055,409, Cl. 71-76.000.

Johnson, Anderson F., Jr.: *See*—
Fegley, Charles R.; and Johnson, Anderson F., Jr., 4,055,277, Cl. 222-5.000.

Johnson, Bruce W. Earth handling apparatus. 4,055,007, Cl. 37-126.0AE.

Johnson, Harlan B., to PPG Industries, Inc. Electrolyzing brine using an anode coated with an intermetallic compound. 4,055,477, Cl. 204-98.000.

Johnson & Johnson: *See*—
Gander, Robert J.; and Gurney, John A., 4,055,659, Cl. 424-305.000.
Sack, Georges H., 4,055,003, Cl. 34-155.000.
Torney, Harry L.; Torney, Helen T.; and Bordt, Dale E., 4,055,466, Cl. 195-1.700.
Tritsch, Ludwig, 4,055,181, Cl. 128-287.000.

Johnson, W. Delmar: *See*—
Moczygemba, George A.; Johnson, W. Delmar; and Clark, Earl, 4,055,713, Cl. 526-207.000.

Johnson, William S.; and Gravestock, Michael B., to Leland Stanford Junior University, The Board of Trustees of. Alkinyl terminating groups in biogenetic-like cyclizations to steroids. 4,055,603, Cl. 260-617.00R.

Johnston, James R.: *See*—
Moertel, George B.; and Johnston, James R., 4,054,973, Cl. 24-205.00R.

Johnston, John O'Neal: *See*—
Benson, Harvey D.; Grunwell, Joyce Francis; Johnston, John O'Neal; and Petrow, Vladimir, 4,055,641, Cl. 424-242.000.

Jolivet, Jean-Claude; and Stouls, Francois-Xavier Antoine, to Societe Anonyme de Telecommunications. Image coder-decoder using a matrix transform with weighted contribution of several points of the image to the formation of one point of the transform. 4,055,756, Cl. 364-725.000.

Jones, Dennis J., to Tumble Not Tumbler, Inc. Spill-resistant container. 4,055,273, Cl. 220-70.000.

Jones, James H.: *See*—
Cragoe, Edward J., Jr.; and Jones, James H., 4,055,596, Cl. 260-534.00M.

Jones, Robert L. Solar energy collector and sun tracking concentrator. 4,055,161, Cl. 126-271.000.

Jones, Russell E.: *See*—
Laiche, Emile J.; and Jones, Russell E., 4,055,337, Cl. 267-101.000.

Jones, Thomas M.: *See*—
Freeman, John W.; Jones, Thomas M.; and Reagan, Harold D., 4,054,978, Cl. 29-157.10R.

Jozwiak, Edward L., Jr.; and Das, Suryya K., to PPG Industries, Inc. Method and resinous vehicles for electrodeposition. 4,055,527, Cl. 260-23.70A.

Jung, Dietrich: *See*—
Fisk, Charles S.; and Jung, Dietrich, 4,055,800, Cl. 324-72.500.

Justice, David D.: *See*—
Dotson, Ronald L.; Justice, David D.; and Kuo, Han C., 4,055,475, Cl. 204-98.000.

JWI Ltd.: *See*—
Best, Francis Brian, 4,055,459, Cl. 162-192.000.
Buchanan, John Gordon, 4,055,460, Cl. 162-209.000.

K-Vet Limited: *See*—
Sheaff, Edward Thomas; and Hinton, Norman Alexander, 4,055,470, Cl. 195-127.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Hara, Hideo, 4,055,047, Cl. 60-444.000.

Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, 4,055,118, Cl. 101-110.000.

Kadono, Mamoru: *See*—
Fujisawa, Masao; Makise, Mitsugu; and Kadono, Mamoru, 4,055,136, Cl. 114-219.000.

Kadzhelashvili, Zauri Mikhailovich: *See*—
Gvelesiani, Konstantin Shalvovich; Kadzhelashvili, Zauri Mikhailovich; Tskvitinidze, Alexandr Shalvovich; Tusishvili, Otari Shalvovich; Sherezadashvili, Andrei Illarionovich; Khabuliani, Gamlet Varlamovich; Bakhanova, Lia Nakhshonovna; and Tatishvili, Otari Vardenovich, 4,055,315, Cl. 243-33.000.

Kageyama, Yoichi; Kato, Yozo; and Kosugi, Hisao, to Mitsubishi Chemical Industries Ltd. Catalyst for producing cycloolefin and method for making the same. 4,055,512, Cl. 252-441.000.

Kainmuller, Thomas: *See*—
Herzog, Hans; Buxbaum, Lothar; Kainmuller, Thomas; and Habermeier, Jurgen, 4,055,570, Cl. 548-301.000.

Kaiser, Emil: *See*—
Colescott, Robert L.; Kaiser, Emil; Bossinger, Charles D.; and Cook, Paul I., 4,055,524, Cl. 260-8.000.

Kaiser, Michael; and Schaffer, Ludwig, to Agfa-Gevaert Aktiengesellschaft. Photographic apparatus. 4,055,289, Cl. 226-92.000.

Kakitani, Haruaki; and Sugino, Satoru, to Mitsubishi Monsanto Chemical Company. Vinyl chloride resin composition. 4,055,518, Cl. 260-2.5AM.

Kalapos, Josef: *See*—
Mueller, Roman; and Kalapos, Josef, 4,055,673, Cl. 426-231.000.

Kalbow, Heinz. Cleaning, scouring and/or polishing pads. 4,055,029, Cl. 51-395.000.

Kaltenberg, Hans-Georg: *See*—
Kampf, Fritz; and Kaltenberg, Hans-Georg, 4,055,218, Cl. 165-1.000.

Kamada, Kensuke; Minami, Shunsuke; and Yoshida, Kanji, to Mitsubishi Rayon Co., Ltd. Porous polypropylene hollow filaments and method making the same. 4,055,696, Cl. 428-398.000.

Kamm, Wolfgang, to Maschinenfabrik Wifag. Apparatus for adjusting a tensioning device in plate cylinders of rotary printing machines. 4,055,120, Cl. 101-378.000.

Kamp, Walter B.; Kimmel, Richard L.; and Aasgaard, Alvin L. P., III. Rotary cutting assembly having novel flail. 4,054,993, Cl. 30-276.000.

Kampf, Fritz; and Kaltenberg, Hans-Georg, to Vereinigte Aluminum-Werke Aktiengesellschaft. Method and arrangement for changing the temperature of fluids which form incrustations. 4,055,218, Cl. 165-1.000.

Kan, Osamu, to Dai Nippon Insatsu Kabushiki Kaisha. Method and apparatus for producing self-standing bags. 4,055,109, Cl. 93-35.00R.

Kaneko, Katsuyoshi, to Maruwa Echo Co., Ltd. Detachable luggage caster roller. 4,054,964, Cl. 16-20.000.

Kao Soap Co., Ltd.: *See*—
Hosoya, Minoru, 4,055,292, Cl. 229-17.00M.

Kappe, Walter; Lampe, Gotz-Reinhard; and Neuer, Harald, to Carl Zeiss-Stiftung. Method and apparatus for the determination of enzyme activity. 4,055,752, Cl. 364-551.000.

Kapral, Ales M., to Akrosil Corporation. Production of three-dimensional designs. 4,055,613, Cl. 264-46.400.

Karami, Hamzeh, to Colgate-Palmolive Company. Absorbent article with retained hydrocolloid material. 4,055,180, Cl. 128-287.000.

Karami, Hamzeh, to Colgate-Palmolive Company. Absorbent pad. 4,055,184, Cl. 128-287.000.

Kashiwagi, Koh: *See*—
Okudaira, Shigenori; Takahashi, Mitsuo; Irie, Takefumi; Itoh, Eiji; and Kashiwagi, Koh, 4,055,621, Cl. 423-79.000.

Katagawa, Kikuji: *See*—
Sawanishi, Shigeru; Ozaki, Masahiko; and Katagawa, Kikuji, 4,055,493, Cl. 210-31.00C.

Kataoka, Yushin: *See*—
Okamoto, Masahiro; Nemoto, Makoto; Kataoka, Yushin; and Tokugawa, Yoshiharu, 4,055,585, Cl. 260-453.0SP.

Kato, Giichiro. Rotary electric field intensity measuring device. 4,055,798, Cl. 324-32.000.

Kato, Nobuyuki: *See*—
Yoshimura, Hisashi; Yukimoto, Sadao; Matsumoto, Takashi; Konno, Isago; Kato, Nobuyuki; Ohtani, Tadao; and Kubo, Takao, 4,055,732, Cl. 179-117.000.

Kato, Yozo: *See*—
Kageyama, Yoichi; Kato, Yozo; and Kosugi, Hisao, 4,055,512, Cl. 252-441.000.

Katoh, Tadayoshi, to Fujitsu Limited. Partial response, quadrature amplitude modulation system. 4,055,727, Cl. 178-68.000.
Kats, Mindert; and Sleumer, Hendrikus Bernardus, to U.S. Philips Corporation. Appliance for making coffee and the like. 4,055,114, Cl. 99-280.000.
Katsenes, Philip K. Modifiable gun stock. 4,055,016, Cl. 42-71.00R.
Kattenberg, Hans Robert; and Verburg, Charles Cornelis, to Lever Brothers Company. Plastic fat product. 4,055,679, Cl. 426-607.000.
Katz, George M.: *See*—
Auerbach, Albert A.; Katz, George M.; and Steinberg, Sidney, 4,055,189, Cl. 128-419.0PG.
Kawahara, Akira, to Ryusyo Industrial Co., Ltd. Clasping device. 4,054,971, Cl. 24-68.0CD.
Kawai, Shichio; Tanaka, Takaho; Bannai, Eisuke; Uchida, Kenji; and Shimizu, Ryuichi, to National Institute for Researches in Inorganic Materials. Thermionic emission cathode having a tip of a single crystal of lanthanum hexaboride. 4,055,780, Cl. 313-346.00R.
Kawanee Industries: *See*—
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,055,712, Cl. 526-11.100.
Kawata, Noboru; Honna, Kosaku; and Sugahara, Hirozo, to Idemitsu Kosan Company, Ltd. Method of producing unsaturated carbonyl compounds. 4,055,721, Cl. 560-207.000.
Kazantsev, Lev Seliverstovich: *See*—
Lukyanov, Jury Sergeevich; Kazantsev, Lev Seliverstovich; Pomeschikov, Andrei Grigorievich; and Skvortsov, Gennady Fedorovich, 4,055,722, Cl. 13-16.000.
Kearney, Thomas J., to Detrex Chemical Industries, Inc. Immersion type metal degreaser with compression-expansion system for heating and cooling of liquid solvent and solvent vapors. 4,055,196, Cl. 134-107.000.
Keen, Ralph H.; and Seaman, Gary G., to Western Electric Company, Inc. Method for separating sections of a covering on a cable. 4,055,616, Cl. 264-139.000.
Keiper K.G.: *See*—
Putsch, Ulrich; and Klingelhofer, Gerd, 4,054,966, Cl. 16-143.000.
Keller, Douglas V., Jr.: *See*—
Smith, Clay D.; and Keller, Douglas V., Jr., 4,055,480, Cl. 208-11.0LE.
Kelly, Ray G.; Pruitt, Kenneth R., Sr.; and Kershman, Alvin L., to Sunmark, Inc. Food bar and process of preparing same. 4,055,669, Cl. 426-93.000.
Kendall Company, The: *See*—
Patel, Bhupendra C.; Binard, William J.; and McWhorter, Daniel M., 4,055,187, Cl. 128-349.00B.
Swallow, Roger T., 4,054,952, Cl. 2-338.000.
Ker-Train Systems N.V.: *See*—
Kerr, John Hugh, 4,055,091, Cl. 74-394.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Coster, Hans; Pilwat, Gunter; and Zimmermann, Ulrich, 4,055,799, Cl. 324-71.00R.
Mallek, Heinz, 4,055,125, Cl. 110-8.00R.
Kerr, John Hugh, to Ker-Train Systems N.V. Variable output transmission. 4,055,091, Cl. 74-394.000.
Kershman, Alvin L.: *See*—
Kelly, Ray G.; Pruitt, Kenneth R., Sr.; and Kershman, Alvin L., 4,055,669, Cl. 426-93.000.
Kestian, Anthony M.; and Allori, Raymond J., to International Harvester Company. Vehicle control armrest in a vibration isolated control module. 4,055,230, Cl. 180-89.100.
Ketchum, Ronald L.: *See*—
Pike, Harold L.; Thomas, G. Lamar; Ketchum, Ronald L.; and Evans, John F., 4,055,801, Cl. 324-73.00R.
Khabuliani, Gamlet Varlamovich: *See*—
Gvelesiani, Konstantin Shalvovich; Kadzhelashvili, Zauri Mikhailovich; Tskvitinidze, Alexandr Shalvovich; Tusishvili, Otari Shalvovich; Sherezadashvili, Andrei Illarionovich; Khabuliani, Gamlet Varlamovich; Bakhanova, Lia Nakhshonovna; and Tatishvili, Otari Vardenovich, 4,055,315, Cl. 243-33.000.
Khavkin, Viktor Pavlovich: *See*—
Movshovich, Pavel Mikhailovich; Maximov, Gennady Konstantinovich; Khavkin, Viktor Pavlovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Afanasiev, Vladimir Konstantinovich; Kudryavtseva, Tamara Nikolaevna; and Nezelenov, Sergei Vladimirovich, 4,055,039, Cl. 57-34.0AT.
Kidd, Earl H., to Outboard Marine Corporation. Multiple spindle rotary mower. 4,055,036, Cl. 56-13.600.
Kidwell, Louis E., Jr., to Pennzoil Company. Two-stage process for manufacture of white oils. 4,055,481, Cl. 208-89.000.
Kikumoto, Ryoji: *See*—
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,055,636, Cl. 424-177.000.
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,055,651, Cl. 424-267.000.
Kim, Young D., to Ashland Oil, Inc. Phenol-formaldehyde resin for foundry applications. 4,055,528, Cl. 260-29.300.
Kimmel, Richard L.: *See*—
Kamp, Walter B.; Kimmel, Richard L.; and Aasgaard, Alvin L. P., III, 4,054,993, Cl. 30-276.000.
King, Arthur S. Fluid treater having electric field warping means. 4,055,479, Cl. 204-302.000.
King-Seeley Thermos Co.: *See*—
Kohl, Vance L.; and Spinner, Joseph R., 4,055,280, Cl. 222-70.000.
Kirch, John Nicholas, to Borden, Inc. Developer for printing plates. 4,055,515, Cl. 252-542.000.
Kirchhan, James J. Jet drive boat cover. 4,055,140, Cl. 115-76.000.
Kissell, Fred N.: *See*—
Thimons, Edward D.; Vinson, Robert P.; Kissell, Fred N.; and Tall, Albert, 4,055,074, Cl. 73-40.000.
Kitzing, Rainer: *See*—
Kyburz, Rolf; and Kitzing, Rainer, 4,055,431, Cl. 96-111.000.
Kiyokawa, Shin; Sakaguchi, Shokichi; and Takeuchi, Toru. Planar heating element and production thereof. 4,055,526, Cl. 264-22.000.
Klaiber, Erich Manfred: *See*—
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,055,506, Cl. 252-132.000.
Klamm, Robert L.; and Day, Maurice R., to Barry-Wehmiller Company. Container liquid level detector apparatus. 4,055,252, Cl. 209-74.00M.
Kleen, Gerhard; Schiemann, Heinz; and Allmendinger, Karl, to Siemens Aktiengesellschaft. Voltage transformer for high voltage. 4,055,825, Cl. 336-70.000.
Klein Associates, Inc.: *See*—
Klein, Martin, 4,055,138, Cl. 114-244.000.
Klein, Gerald Wayne: *See*—
Snoke, Roy Eugene; and Klein, Gerald Wayne, 4,055,469, Cl. 195-66.00R.
Klein, Heinz Gunter: *See*—
Niederprum, Hans; Klein, Heinz Gunter; and Meussdoerffer, Johann-Nikolaus, 4,055,458, Cl. 156-663.000.
Klein, Martin, to Klein Associates, Inc. Underwater vehicle towing and recovery apparatus. 4,055,138, Cl. 114-244.000.
Klett, Gene R.: *See*—
Casey, Thomas P.; Hansen, Howard A.; Klett, Gene R.; and Olthoff, James A., 4,055,223, Cl. 172-777.000.
Klingelhofer, Gerd: *See*—
Putsch, Ulrich; and Klingelhofer, Gerd, 4,054,966, Cl. 16-143.000.
Klink, Arthur E.: *See*—
Elion, Glenn R.; and Klink, Arthur E., 4,055,511, Cl. 252-435.000.
Elion, Glenn R.; and Klink, Arthur E., 4,055,514, Cl. 252-470.000.
Klochko, Viktor Alexandrovich: *See*—
Yakshin, Alexandr Sergeevich; Novikov, Oleg Nikolaevich; Grechinsky, Dmitry Alexeevich; Klochko, Viktor Alexandrovich; and Rygalin, Viktor Georgievich, 4,055,842, Cl. 340-347.0AD.
KMS Fusion, Inc.: *See*—
Solomon, David E., 4,055,276, Cl. 222-3.000.
Knab, James V. Surgical masking and ventilating system. 4,055,173, Cl. 128-139.000.
Knapp, Edward J., Jr., to Gould, Inc. Electric fuse. 4,055,827, Cl. 337-297.000.
Knapp, John P.: *See*—
Siri, Joseph J.; and Knapp, John P., 4,055,488, Cl. 209-173.000.
Kny, Hermann, to Ciba-Geigy Corporation. Process for the production of beta-chloroethyltrichlorosilane. 4,055,584, Cl. 260-448.20E.
Kobayashi, Takao: *See*—
Nakamura, Masatatsu; Kominami, Hideyuki; Amagami, Keizo; Kobayashi, Takao; and Toyooka, Tadao, 4,055,740, Cl. 219-10.49R.
Koester, Harold J.: *See*—
Vig, Satinder K.; Koester, Harold J.; and Berg, William H., Jr., 4,054,965, Cl. 16-35.00D.
Kohl, Vance L.; and Spinner, Joseph R., to King-Seeley Thermos Co. Diverter valve assembly for ice distribution systems. 4,055,280, Cl. 222-70.000.
Kojima, Shirou. Sticker package. 4,055,249, Cl. 206-447.000.
Koller, Stefan; Pacher, Marielise; and Emmenegger, Karl, to Ciba-Geigy Corporation. Process for dyeing blended fabrics. 4,055,392, Cl. 8-21.00C.
Kolling, Georg; and Romey, Ingo, to Bergwerksverband GmbH. Method for the production of carbonaceous articles, particularly strands. 4,055,583, Cl. 423-447.400.
Kolman, Anita M. Coupling device for the opposed ends of bracelets. 4,055,057, Cl. 63-7.000.
Komendowski, Henry, to Automatic Liquid Packaging, Inc. Container with one-piece neck and discharge controller. 4,055,282, Cl. 222-421.000.
Kominami, Hideyuki: *See*—
Nakamura, Masatatsu; Kominami, Hideyuki; Amagami, Keizo; Kobayashi, Takao; and Toyooka, Tadao, 4,055,740, Cl. 219-10.49R.
Komiyama, Yoshiro; Uchida, Kunihiko; and Tokui, Masaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hyper-eutectic aluminum-silicon based alloys for castings. 4,055,417, Cl. 75-142.000.
Kondo, Toshio: *See*—
Numazawa, Akio; Nakamura, Hiroyuki; Kurita, Tokio; Horie, Kouji; and Kondo, Toshio, 4,055,237, Cl. 188-73.400.
Konii, Susumu: *See*—
Chu, Tzong Jeng; and Konii, Susumu, 4,055,546, Cl. 260-51.00R.
Konishi, Masami; and Futamura, Kazumasa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Manifold reactor. 4,055,043, Cl. 60-282.000.
Konno, Isago: *See*—
Yoshimura, Hisashi; Yukimoto, Sadao; Matsumoto, Takashi; Konno, Isago; Kato, Nobuyuki; Ohtani, Tadao; and Kubo, Takao, 4,055,732, Cl. 179-117.000.
Konno, Koji: *See*—
Saitoh, Shigeru; Watanabe, Tetsuya; Konno, Koji; and Nakamura, Tadashi, 4,055,623, Cl. 423-235.000.

Kono, Toshiyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel supply system for a rotary piston engine. 4,055,153, Cl. 123-8.090.

Kono, Toshiyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel supply system for a rotary piston engine. 4,055,154, Cl. 123-8.090.

Kono, Toshiyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel supply system for a rotary piston engine. 4,055,155, Cl. 123-8.090.

Kopp, Georg, to S I G Schweizerische Industrie-Gesellschaft. Infusion package. 4,055,668, Cl. 426-79.000.

Korenaga, Tokiyoshi: *See—*
Yano, Nobumitsu; Fukinbara, Itaru; Yoshida, Koji; and Korenaga, Tokiyoshi, 4,055,674, Cl. 426-430.000.

Kosicki, Witold W.; and Hollingsworth, Charles M., to Horsman Dolls Inc. Gas-filled resilient doll with movable head and limbs. 4,055,020, Cl. 46-161.000.

Kosugi, Hisao: *See—*
Kageyama, Yoichi; Kato, Yozo; and Kosugi, Hisao, 4,055,512, Cl. 252-441.000.

Kovaleski, Joseph J., to Wyrepak Industries, Inc. Wire pay-off cap assembly for wire spools. 4,055,314, Cl. 242-128.000.

Koyama, Koichi; Maekawa, Yukio; and Miyakawa, Masami, to Fuji Photo Film Co., Ltd. Redox dye releasers o-sulfonamidophenol. 4,055,428, Cl. 96-73.000.

Kozima, Toyoo, to Hidaka Engineering Co., Ltd. Method and a punch/die assembly for the production of heat exchanger fins. 4,055,067, Cl. 72-328.000.

Kozlov, Vladimir Borisovich. Apparatus for and method of regasifying liquefied natural gas. 4,055,050, Cl. 60-692.000.

Kozlovsky, Viktor Stepanovich: *See—*
Pavlushkin, Nikolai Mikheevich; Bondarev, Konstantin Timofeevich; Strekalov, Anatoly Vasilievich; Kozlovsky, Viktor Stepanovich; Minakov, Anatoly Gavrilovich; Golius, Tamara Efimovna; Orlova, Ljudmila Alexeevna; Sarkisov, Pavel Dzhibraelovich; Kozmin, Mikhail Ivanovich; and Minakov, Vladimir Anatolievich, 4,055,436, Cl. 106-52.000.

Kozmin, Mikhail Ivanovich: *See—*
Pavlushkin, Nikolai Mikheevich; Bondarev, Konstantin Timofeevich; Strekalov, Anatoly Vasilievich; Kozlovsky, Viktor Stepanovich; Minakov, Anatoly Gavrilovich; Golius, Tamara Efimovna; Orlova, Ljudmila Alexeevna; Sarkisov, Pavel Dzhibraelovich; Kozmin, Mikhail Ivanovich; and Minakov, Vladimir Anatolievich, 4,055,436, Cl. 106-52.000.

Kraley, Raymond L.; Pressman, Barry M.; and Chana, Maghar S. Combined watt and var transducer. 4,055,803, Cl. 324-142.000.

Kraushaar, Jonathan Moses. Electronic Hebrew calendar and date calculator. 4,055,749, Cl. 235-92.0PE.

Krebs, Charles, to Molins Machine Company, Inc. Stacking apparatus. 4,055,257, Cl. 214-6.0DK.

Kreighbaum, William E.; Matier, William L.; and Roth, Herbert R., to Mead Johnson & Company. Cyanomethylphenethanolamines. 4,055,658, Cl. 424-304.000.

Kreischer, Lois A. Board game apparatus. 4,055,347, Cl. 273-135.00D.

Krekeler, Ulrich: *See—*
Feneberg, Paul; and Krekeler, Ulrich, 4,055,378, Cl. 351-160.000.

Krenzer, John: *See—*
Wu, Chin Ching; and Krenzer, John, 4,055,569, Cl. 260-305.000.

Krips, Herbert; and Podhorsky, Miroslav, to Balcke-Durr Aktiengesellschaft. Apparatus for the expansion of tube ends inside of a tube plate. 4,055,063, Cl. 72-62.000.

Kroenke, William Joseph, to B. F. Goodrich Company, The. Smoke retardant vinyl chloride and vinylidene chloride polymer compositions. 4,055,537, Cl. 260-45.75D.

Kroenke, William Joseph, to B. F. Goodrich Company, The. Smoke retardant vinyl chloride and vinylidene chloride polymer compositions. 4,055,538, Cl. 260-45.75P.

Kronenwetter, Howard W.; and Schultz, Freddy R., to Aluminum Company of America. Sheet metal container. 4,055,271, Cl. 220-64.000.

Krueger Metal Products, Inc.: *See—*
Weagle, James A., 4,055,124, Cl. 108-132.000.

Kubo, Takao: *See—*
Yoshimura, Hisashi; Yukimoto, Sadao; Matsumoto, Takashi; Konno, Isago; Kato, Nobuyuki; Ohtani, Tadao; and Kubo, Takao, 4,055,732, Cl. 179-117.000.

Kubota, Masao: *See—*
Ikari, Shinichi, 4,055,711, Cl. 429-143.000.

Kucherry, James David. Choker assembly. 4,055,365, Cl. 294-78.00R.

Kudryavtseva, Tamara Nikolaevna: *See—*
Movshovich, Pavel Mikhailovich; Maximov, Gennady Konstantinovich; Khavkin, Viktor Pavlovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Afanasiev, Vladimir Konstantinovich; Kudryavtseva, Tamara Nikolaevna; and Nezelenov, Sergei Vladimirovich, 4,055,039, Cl. 57-34.0AT.

Kulikowski, Donald F.: *See—*
Ostrem, Obert M.; Kulikowski, Donald F.; and Pulciani, Sam C., 4,055,134, Cl. 113-121.00C.

Kunst, Helmut; and Scondo, Christian, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Salt bath quenching of construction parts treated with a nitriding bath. 4,055,446, Cl. 148-15.000.

Kuo, Han C.: *See—*
Dotson, Ronald L.; Justice, David D.; and Kuo, Han C., 4,055,475, Cl. 204-98.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Saitoh, Shigeru; Watanabe, Tetsuya; Konno, Koji; and Nakamura, Tadashi, 4,055,623, Cl. 423-235.000.

Kurinny, Vladimir Ivanovich: *See—*
Akimov, Jury Stepanovich; Sushkov, Valery Petrovich; and Kurinny, Vladimir Ivanovich, 4,055,443, Cl. 148-1.500.

Kurita, Tokio: *See—*
Numazawa, Akio; Nakamura, Hiroyuki; Kurita, Tokio; Horie, Kouji; and Kondo, Toshio, 4,055,237, Cl. 188-73.400.

Kurner, Rudolf. Antimicrobial composition containing 10-undecensic acid isopropylic ester. 4,055,662, Cl. 424-312.000.

Kurumada, Tomoyuki: *See—*
Soma, Nobuo; Yoshioka, Takao; Kurumada, Tomoyuki; and Morimura, Syoji, 4,055,536, Cl. 260-45.80N.

Kusumoto, Teruo: *See—*
Sakurai, Yasuhiko; Ishida, Toshio; and Kusumoto, Teruo, 4,055,831, Cl. 340-80.000.

Kuznetsov, Igor Georgievich: *See—*
Voronkov, Mikhail Grigorievich; Platonova, Ada Timofeevna; Mansurova, Ljudmila Andreevna; Kuznetsov, Igor Georgievich; Zelchan, Gunar Izidorovich; and Dyakov, Valery Mikhailovich, 4,055,637, Cl. 424-184.000.

Kyburz, Rolf; and Kitzing, Rainer, to Ciba-Geigy AG. N(β-chloro-propionyl or acryloyl)carbamyl or ureido piperazines. 4,055,431, Cl. 96-111.000.

Lace, Melvin Arthur, to Motorola, Inc. Front drive cartridge-tape player system with fast forward and reverse modes. 4,055,288, Cl. 226-1.000.

Lacy, James Volney: *See—*
Angner, Ronald Joseph; and Lacy, James Volney, 4,055,731, Cl. 179-99.000.

Ladrick, Ray C. Antenna erecting system. 4,055,845, Cl. 343-715.000.

Laiche, Emile J.; and Jones, Russell E., to Nachman Corporation. Spring assembly and clip. 4,055,337, Cl. 267-101.000.

Lajovic, Dusan Sava. Method and apparatus for performing a plurality of sequential operations upon each of a series of articles. 4,055,142, Cl. 118-46.000.

Lamendour, Andre. Automatic machine for bending sheet material. 4,055,066, Cl. 72-306.000.

Lampe, Gotz-Reinhard: *See—*
Kappe, Walter; Lampe, Gotz-Reinhard; and Neuer, Harald, 4,055,752, Cl. 364-551.000.

Langley, Philip Edward; and Tulip, Robert, to Imperial Chemical Industries Limited. Cyclohexane oxidation process. 4,055,600, Cl. 260-586.00P.

Langr, Oldrich, to Sigma Lutin, narodni podnik. Drawing die for elongated twist bodies. 4,055,073, Cl. 72-467.000.

Lanning, John A.: *See—*
Gunzner, Fred G.; Edwards, Dale; and Lanning, John A., 4,055,204, Cl. 144-238.000.

Lapera, Dominic J.; and Lapera, Joseph. Liquid dispenser for a motor vehicle. 4,055,279, Cl. 222-54.000.

Lapera, Joseph: *See—*
Lapera, Dominic J.; and Lapera, Joseph, 4,055,279, Cl. 222-54.000.

Lapiere, Charles L.: *See—*
Delarge, Jacques E.; Lapiere, Charles L.; and Georges, Andre H., 4,055,650, Cl. 424-263.000.

Larkfeldt, Birger, to AB Svenska Flaktfabriken. Process and apparatus for ventilating or tempering rooms. 4,055,112, Cl. 98-33.00A.

Larsen, Robert H.; and Minalga, Philip F., to Singer Company, The. Bight stop mechanism for sewing machines. 4,055,130, Cl. 112-158.00R.

Lasater, Henry C., to Dimmer, Donald J., a part interest. Battery-operated motor with back EMF charging. 4,055,789, Cl. 320-6.000.

Laske, Louis Lawrence, to Vonco Products, Inc. Process for forming peelable seals. 4,055,454, Cl. 156-290.000.

Last, Anthony Graham Marshall; and Rixon, John Albert, to Imperial Chemical Industries Limited. Foamed polyolefine films. 4,055,695, Cl. 428-195.000.

Latimer, Michael John: *See—*
Cockbain, Alan Gray; Latimer, Michael John; and Parr, Norman Lawrence, 4,055,451, Cl. 156-89.000.

Lauer, John B.; and Wade, Betty Alma, to Lauer, John B. Card holder. 4,055,381, Cl. 355-75.000.

Lavigne, Joe B., to Chevron Research Company. PVC Plasticized with tetracarboxylates. 4,055,531, Cl. 260-31.80B.

Lawrence Peska, Associates, Inc.: *See—*
Seymour, Joseph A., 4,055,278, Cl. 222-42.000.

Laxo, Darryl E. Fluid separator. 4,055,499, Cl. 210-119.000.

Leal, Juan Castillo: *See—*
Metzger, Shirley Jean; Smith, James Walker; and Leal, Juan Castillo, 4,054,970, Cl. 17-71.000.

Lecoq, Pierre: *See—*
Faugeras, Pierre; Lecoq, Pierre; Miquel, Pierre; Rouyer, Hubert; and Simonet, Guy, 4,055,625, Cl. 423-262.000.

Lee, David. Elevating roofs. 4,055,366, Cl. 296-23.00G.

Lee, John M., to Dow Chemical Company, The. Process for preparation of urea autocondensation product. 4,055,598, Cl. 260-553.00B.

Lee, Sherman E. Forced air heating system utilizing fireplace as primary heat source. 4,055,297, Cl. 236-11.000.

Lee, Thomas Brian: *See—*
Cairns, Hugh; Chambers, Albert; and Lee, Thomas Brian, 4,055,654, Cl. 424-283.000.

Leeds & Northrup Company: *See—*
Vanderford, Wallace Snow, 4,055,723, Cl. 13-25.000.

Leesona Corporation: *See—*
Hayward, Glenn L., 4,055,389, Cl. 425-466.000.

Legrand, Pierre N.: *See*—
Bayorgeon, Jeffrey T.; Vandalen, Dirk J.; and Legrand, Pierre N., 4,055,061, Cl. 72-32.000.

Lehman, James Arlo, to Warner-Lehman Corporation. Cigarette snuffing attachment for an ashtray. 4,055,193, Cl. 131-235.00R.

Leibert, Curt H.: *See*—
Stecura, Stephan; and Leibert, Curt H., 4,055,705, Cl. 428-633.000.

Leisure Manufacturing Co., Inc.: *See*—
Hammond, Grover M., 4,055,329, Cl. 254-86.00R.

Leland Stanford Junior University, The Board of Trustees of: *See*—
Johnson, William S.; and Gravestock, Michael B., 4,055,603, Cl. 260-617.00R.

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Leung, Tommy Y., to CTS Corporation. Digitally coded electrical supply system. 4,055,772, Cl. 307-10.00R.

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Kattenberg, Hans Robert; and Verburg, Charles Cornelis, 4,055,679, Cl. 426-607.000.

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Holsinger, Jerry L.; Williams, David E.; Lezotte, Frank B.; and Falkenstein, Don I., 4,055,733, Cl. 179-175.30R.
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Heumann, Heinz; Saure, Manfred; Wagner, Heinz; and Wartusch, Johann, 4,055,504, Cl. 252-63.200.
Rinderle, Heinz, 4,055,822, Cl. 334-15.000.

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Gunzner, Fred G.; Edwards, Dale; and Lanning, John A., 4,055,204, Cl. 144-238.000.

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Norman, Vello; and Bryant, Herman G., Jr., 4,055,191, Cl. 131-9.000.

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Lin, Perry Han-Cheng, to Du Pont de Nemours, E. I., and Company. Alternately twisted yarn assembly and method for making. 4,055,040, Cl. 57-140.0BY.

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Lindsay, James Henry Richard. Frames for motorcycles. 4,055,229, Cl. 180-32.000.

Linnecke, Carl B.: *See*—
Friedman, Stephen B.; and Linnecke, Carl B., 4,055,394, Cl. 23-253.0TP.

Linton, John H.; Esdale, William J.; and Cross, John Viscount, to Ogilvie Mills Ltd. Animal feeds. 4,055,667, Cl. 426-62.000.

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Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., 4,055,702, Cl. 428-398.000.

Loch, Ernst, to Zellweger Uster AG. Method and apparatus for the moisture measurement of textile webs. 4,055,077, Cl. 73-73.000.

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Skeggs, Leonard T., 4,055,839, Cl. 340-279.000.

Lohoff, Warren G. Moisture detection apparatus. 4,055,200, Cl. 137-624.110.

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Looney, John H., to Xerox Corporation. Sorter apparatus. 4,055,339, Cl. 271-173.000.

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Wittnebel, Bruce W.; and Lowrey, R. Dean, 4,055,422, Cl. 96-22.000.

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Lukyanov, Jury Sergeevich; Kazantsev, Lev Seliverstovich; Pomeschikov, Andrei Grigorievich; and Skvortsov, Gennady Fedorovich. Electrode holder. 4,055,722, Cl. 13-16.000.

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Ronnquist, Axel Georg; Lindahl, Erik Tommie; and Stoilov, Nicolay Stefanov, 4,055,700, Cl. 428-366.000.

Lundquist, Ingemar H., to Valleylab. Universal drip chamber and spike assembly. 4,055,176, Cl. 128-214.00C.

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Bayer, Gunther; Fitzky, Hans Georg; Hoyer, Herbert; Luttgens, Gunter; and Muller-Bardorff, Wolfgang, 4,055,685, Cl. 96-87.00R.

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Mack, Robert John, to Colgate-Palmolive Company. Disposable diaper reinforcement. 4,055,182, Cl. 128-287.000.

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Grisar, J. Martin; Claxton, George P.; and MacKenzie, Robert D., 4,055,561, Cl. 260-239.00B.

MacLeay, Ronald E.: *See*—
Sheppard, Chester S.; and MacLeay, Ronald E., 4,055,714, Cl. 526-208.000.

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Frazier, William C., 4,055,071, Cl. 73-12.000.

MacNeill, Robert L.: *See*—
Friedrich, Richard A.; and MacNeill, Robert L., 4,055,496, Cl. 210-87.000.

Maeda, Hidetoshi: *See*—
Nakamura, Tutomu; Sasaki, Takehiko; Yonekawa, Masaji; and Maeda, Hidetoshi, 4,055,755, Cl. 364-705.000.

Maeder, Arthur: *See*—
Huber-Emden, Helmut; Eschle, Karl; and Maeder, Arthur, 4,055,599, Cl. 260-562.00S.
Nachbur, Hermann; and Maeder, Arthur, 4,055,689, Cl. 427-379.000.

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Mager, David; and Heronemus, William E. System and method of ocean thermal energy conversion and mariculture. 4,055,145, Cl. 119-2.000.

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Soley, Warren G., 4,055,489, Cl. 209-223.00R.

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Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., 4,055,523, Cl. 260-2.50R.

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Mahaffy, Reid A.; Hamilton, Joel A.; and Pinney, Wesley W., 4,055,671, Cl. 426-123.000.

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Maher, Richard G. Method for making patterns. 4,055,213, Cl. 164-45.000.

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Fujisawa, Masao; Makise, Mitsugu; and Kadono, Mamoru, 4,055,136, Cl. 114-219.000.

Mallek, Heinz, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Incinerator, especially for burning waste material. 4,055,125, Cl. 110-8.00R.

Mallory, Merrit L.: *See*—
Hudson, Ed D.; and Mallory, Merrit L., 4,055,782, Cl. 315-111.900.

Malone, Laurence A. Pottery-like coating composition. 4,055,533, Cl. 260-37.0EP.

Mandich, Pete. Sanitary device for picking up animal droppings. 4,055,363, Cl. 294-19.00R.

Manecke, Siegfried E.; and Shaw, James L., to Robertshaw Controls Company. Protective shield for a control device. 4,055,724, Cl. 174-66.000.

Manitou Systems, Inc.: *See*—
Thornton, Douglas R.; and Smiglee, Jerome, 4,055,835, Cl. 340-147.0LP.

Manniso, James L.: *See*—
Costello, Frederick A.; Manniso, James L.; DiPinto, Anthony J.; and Smith, Gerald W., 4,055,163, Cl. 126-271.000.

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Holden, Herbert K.; and Mansfield, Peter W., 4,055,108, Cl. 93-1.00C.

Mansurova, Ljudmila Andreevna: *See*—
Voronkov, Mikhail Grigorievich; Platonova, Ada Timofeevna; Mansurova, Ljudmila Andreevna; Kuznetsov, Igor Georgievich; Zelchan, Gunar Izidorovich; and Dyakov, Valery Mikhailovich, 4,055,637, Cl. 424-184.000.

Marchwinski, Michael: *See*—
Barer, Sol J.; Valenti, Peter C.; and Marchwinski, Michael, 4,055,663, Cl. 424-319.000.

Marres, George; and D'Alesandris, Loreto B., to Veeder Industries, Inc. Method of mounting a wheel retaining ring on a wheel support shaft. 4,054,986, Cl. 29-434.000.

Marsan, Mario S., to Procter & Gamble Company, The. Fabric treating compositions and articles. 4,055,248, Cl. 206-.500.

Marsden, James Glenn; and Orenski, Peter Joseph, to Union Carbide Corporation. Azido-silane compositions. 4,055,701, Cl. 428-391.000.

Marsee, Frederick J., to Ethyl Corporation. Exhaust recirculation. 4,055,158, Cl. 123-119.00A.

Martin, Jack P.; and Gray, Thomas H., to Allegheny Ludlum Industries, Inc. Process for manufacturing strip lead frames. 4,055,062, Cl. 72-47.000.

Martin, John J.: *See—*
Hadgraft, Robert B.; and Martin, John J., 4,055,694, Cl. 428-95.000.

Martin, Manuel I.: *See—*
Meyer, Rolf; and Martin, Manuel I., 4,055,396, Cl. 23-259.000.

Martinez, Daniel G., to Gilbert Sacks Enterprises, Inc. Tilting maze race game. 4,055,341, Cl. 273-86.00C.

Martinez, Ginez. Silencer for internal combustion engines. 4,055,231, Cl. 181-241.000.

Martinez, John. Hairdresser's storage and dispenser case. 4,055,194, Cl. 132-39.000.

Maruwa Echo Co., Ltd.: *See—*
Kaneko, Katsuyoshi, 4,054,964, Cl. 16-20.000.

Maruzen Sewing Machine Co., Ltd.: *See—*
Nishigami, Teiichi, 4,055,128, Cl. 112-158.00A.

Marzoni, Pettersen B., Jr. Word building game. 4,055,348, Cl. 273-146.000.

Maschinenfabrik Wifag: *See—*
Kamm, Wolfgang, 4,055,120, Cl. 101-378.000.

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Stern, Ernest; Williamson, Richard C.; Bers, Abraham; and Cafarella, John H., 4,055,758, Cl. 364-821.000.

Massey, Arie F., Jr., to Robertshaw Controls Company. Valve construction and method of making the same. 4,054,979, Cl. 29-157.10R.

Massin, Daniel Maurice, to Foseco Trading A.G. Lining slabs. 4,055,336, Cl. 266-283.000.

Masuda, Takao; and Adachi, Keiichi, to Fuji Photo Film Co., Ltd. Thermodevelopable photographic material. 4,055,432, Cl. 96-114.100.

Masuzima, Sho; Takahashi, Tetsuo; Taguchi, Yoshinobu; and Fujita, Hisashi, to Tokyo Denki Kagaku Kogyo Kabushiki Kaisha. Machine for processing and securing parallel lead electronic circuit elements to a printed circuit board. 4,054,988, Cl. 29-564.600.

Mateflex/Mele Corporation: *See—*
Forlenza, Nicholas G., 4,054,987, Cl. 29-452.000.

Mather, Byron L.: *See—*
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Mathieu, Serge, to h.o.p. CONSULAB Inc. Correction system for regulating the power factor of an electrical network. 4,055,795, Cl. 323-102.000.

Matier, William L.: *See—*
Kreighbaum, William E.; Matier, William L.; and Roth, Herbert R., 4,055,658, Cl. 424-304.000.

Matsumoto, Takashi: *See—*
Yoshimura, Hisashi; Yukimoto, Sadao; Matsumoto, Takashi; Konno, Isago; Kato, Nobuyuki; Ohtani, Tadao; and Kubo, Takao, 4,055,732, Cl. 179-117.000.

Matsumoto, Teruo, to Epoch Co., Ltd. Baseball game amusement device. 4,055,342, Cl. 273-88.000.

Matsumoto, Toshiaki: *See—*
Yamanaka, Akira; and Matsumoto, Toshiaki, 4,055,846, Cl. 354-21.000.

Matsushita Electric Industrial Company: *See—*
Nakamura, Masatatsu; Kominami, Hideyuki; Amagami, Keizo; Kobayashi, Takao; and Toyooka, Tadao, 4,055,740, Cl. 219-10.49R.

Matsushita Electric Industrial Company Limited: *See—*
Watanabe, Yasuaki; Okabe, Yukio; Hayakawa, Mitsuru; Ikemura, Yuichi; Fujita, Yasuhiro; and Murakami, Daisuke, 4,055,817, Cl. 331-117.00R.
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Matthewman, Ian: *See—*
Tewsley, Eric William; and Matthewman, Ian, 4,055,058, Cl. 66-50.00R.

Maurer, Gerald L.; and Shringarpurey, Sudhir K., to National Research Laboratories. Complexes of heavy metal ions and polyfunctional organic ligands used as antimicrobial agents. 4,055,655, Cl. 424-294.000.

Maximov, Gennady Konstantinovich: *See—*
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May, Geoffrey John; and McNamee, Michael, to Chloride Silent Power Limited. Electrochemical cells having solid electrolyte of tubular form. 4,055,710, Cl. 429-104.000.

Mayer, Fritz: *See—*
Schafer, Paul; Abel, Heinz; and Mayer, Fritz, 4,055,393, Cl. 8-62.000.

Mayfield, Glenn A. Watt/watthour transducer and amplifier-filter therefor. 4,055,804, Cl. 324-142.000.

Mayhew, Theron T., to Hopkins Manufacturing Corporation. Folding blank, vehicle simulating display. 4,055,250, Cl. 206-457.000.

Maytag Company, The: *See—*
Mellinger, John C., 4,055,242, Cl. 194-55.000.

Maytronics Group, Inc., The: *See—*
Schmidt, Terrance L.; and Thompson, Marion E., 4,055,014, Cl. 40-152.200.

McCarroll, John James; Clark, John Trevor Kent; and Tennison, Stephen Robert, to British Petroleum Company Limited, The. Method for preparing graphite containing carbon. 4,055,628, Cl. 423-448.000.

McCoy, John J.; and Zajacek, John G., to Atlantic Richfield Company. Process for the recovery of selenium from urethanes containing selenium or compounds thereof. 4,055,630, Cl. 423-509.000.

McDonald, Glen E., to United States of America, National Aeronautics and Space Administration. Selective coating for solar panels. 4,055,707, Cl. 428-652.000.

McDonald, Walter; Seitel, Norbert F.; and Burger, Richard A., to Norwalt Design, Inc. Apparatus for lining and testing container closures. 4,055,455, Cl. 156-351.000.

McDonnell Douglas Corporation: *See—*
Osofsky, Irving B.; and Thompson, Hugh C., 4,055,104, Cl. 89-1.00A.

McEsco Inc.: *See—*
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McEwen, Stephen N.: *See—*
Creps, John L.; McEwen, Stephen N.; and Myerholtz, Arthur D., 4,055,497, Cl. 210-91.000.

McGauley, Patrick J.; and Dor, Abraham A., to Hanna Mining Company, The. Production of iron sulfate monohydrate. 4,055,631, Cl. 423-558.000.

McNamee, Michael: *See—*
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McWethy, Irvin E., to Ford Motor Company. Quick-connect tubular couplings. 4,055,359, Cl. 285-39.000.

McWhorter, Daniel M.: *See—*
Patel, Bhupendra C.; Binard, William J.; and McWhorter, Daniel M., 4,055,187, Cl. 128-349.00B.

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Kreighbaum, William E.; Matier, William L.; and Roth, Herbert R., 4,055,658, Cl. 424-304.000.

Means, Robert W., to United States of America, Navy. CCD differential current apparatus. 4,055,776, Cl. 307-355.000.

Meckstroth, Robert C.: *See—*
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Medalert Corporation: *See—*
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Medford, Robert C., to United States of America, Navy. Rejuvenation of nickel-cadmium battery cells. 4,055,709, Cl. 429-49.000.

Medical Specialties, Inc.: *See—*
Johns, Herman S., 4,055,388, Cl. 425-4.00R.

Medvedev, Alexandr Yakovlevich: *See—*
Bykhovsky, David Grigorievich; Medvedev, Alexandr Yakovlevich; Bogorodsky, Jury Alexandrovich; Firsov, Vladimir Nikolaevich; and Rossomakho, Yakov Vulfovich, 4,055,741, Cl. 219-121.00P.

Meierhenry, Dwight W. Treatment for warts. 4,055,660, Cl. 424-310.000.

Meinhart, Robert H. Cover for bicycling shoe to provide a walking surface. 4,055,005, Cl. 36-135.000.

Mellinger, John C., to Maytag Company, The. Tandem-coin slide apparatus. 4,055,242, Cl. 194-55.000.

Mendelson, Wilford Lee, to SmithKline Corporation. Electrochemical reduction of imidazolecarboxylic esters. 4,055,573, Cl. 548-335.000.

Menke, Curtis M., to General Electric Company. Method for protecting stator windings of dynamoelectric machine. 4,055,094, Cl. 82-1.00C.

Menon, Sukumaran K.: *See—*
Hattler, Louis R.; and Menon, Sukumaran K., 4,055,143, Cl. 118-60.000.

Mercaldi, Renaldo: *See—*
Bouchard, Andre C.; Hall, Harold H., Jr.; Mercaldi, Renaldo; and Sentementes, Thomas J., 4,055,759, Cl. 362-159.000.

Merck & Co., Inc.: *See—*
Bolhofer, William A., 4,055,592, Cl. 260-507.00R.
Christy, Marcia Elizabeth, 4,055,665, Cl. 424-330.000.
Cragoe, Edward J., Jr.; and Jones, James H., 4,055,596, Cl. 260-534.00M.
Cragoe, Edward J., Jr.; and Bicking, John B., 4,055,597, Cl. 260-534.00M.
Elion, Glenn R.; and Klink, Arthur E., 4,055,511, Cl. 252-435.000.
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Scriabine, Alexander, 4,055,645, Cl. 424-250.000.

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Engineering Co. Hydrorefining of heavy oil with hydrogen and aluminum alkyl compound. 4,055,483, Cl. 208-213.000.
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Dederra, Helmut; Schmidt, Gunther; and Stanke, Jurgen, 4,055,044, Cl. 60-265.000.
Metge, Michel, to Exxon Production Research Company. Arctic island. 4,055,052, Cl. 61-103.000.
Metropolitan Wire Corporation: *See—*
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Metzger, Shirley Jean; Smith, James Walker; and Leal, Juan Castillo. Apparatus for deheading shrimp. 4,054,970, Cl. 17-71.000.
Meussdoerffer, Johann-Nikolaus: *See—*
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Meyer, Rolf; and Martin, Manuel I., to G. D. Searle & Co. Tray and carrier assembly. 4,055,396, Cl. 23-259.000.
Meyerhoff, Jerry David: *See—*
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Micheron, Francois: *See—*
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Micinski, Leonard J.: *See—*
Stohrer, Charles E., Jr.; Huff, Norman M.; and Micinski, Leonard J., 4,055,132, Cl. 113-116.0EE.
Milcamps, Jacques; and Penet, Alain, to C.G.R.-Mev. Collimator arrangement for a beam of accelerated charged particles. 4,055,770, Cl. 250-505.000.
Miles Laboratories, Inc.: *See—*
Clemens, Anton Hubert; and Myers, Robert Weston, 4,055,175, Cl. 128-213.000.
Miller, Alistair I.: *See—*
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Miller, Don W.; and Gerber, Mark S., to Ohio State University, The. Control system for gamma camera. 4,055,766, Cl. 250-370.000.
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Gerber, Mark S.; and Miller, Don W., 4,055,765, Cl. 250-370.000.
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Hsu, Thomas C.; and Miller, John L., 4,055,462, Cl. 162-382.000.
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Milliken Research Corporation: *See—*
Engels, Walter, 4,054,974, Cl. 26-9.000.
Millsapps, Stuart C., to Hughes Tool Company. Lubricant pressure compensator for an earth boring drill bit. 4,055,225, Cl. 175-228.000.
Minakov, Anatoly Gavrilovich: *See—*
Pavlushkin, Nikolai Mikheevich; Bondarev, Konstantin Timofeevich; Strekalov, Anatoly Vasilievich; Kozlovsky, Viktor Stepanovich; Minakov, Anatoly Gavrilovich; Golius, Tamara Efimovna; Orlova, Ljudmila Alexeevna; Sarkisov, Pavel Dzhibraelovich; Kozmin, Mikhail Ivanovich; and Minakov, Vladimir Anatolievich, 4,055,436, Cl. 106-52.000.
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Minnesota Mining and Manufacturing Company: *See—*
Erickson, Randall L.; and Bailey, Terry R., 4,055,377, Cl. 350-105.000.
Wittnebel, Bruce W.; and Lowrey, R. Dean, 4,055,422, Cl. 96-22.000.
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Motai, Yoichi; Gouda, Keijiro; and Isono, Atsuya, 4,055,137, Cl. 114-230.000.
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Shibata, Jitsu, 4,055,006, Cl. 37-69.000.
Mitsubishi Monsanto Chemical Company: *See—*
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Mitsubishi Rayon Co., Ltd.: *See—*
Kamada, Kensuke; Minami, Shunsuke; and Yoshida, Kanji, 4,055,696, Cl. 428-398.000.
Mitter & Co.: *See—*
Mitter, Mathias, 4,055,119, Cl. 101-120.000.
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Moczygemba, George A.; Johnson, W. Delmar; and Clark, Earl, to Phillips Petroleum Company. Iodine molecular weight regulators in suspension polymerization systems. 4,055,713, Cl. 526-207.000.
Moertel, George B.; and Johnston, James R., to Textron Inc. Slide fastener chain with wide gap and method and apparatus for manufacture. 4,054,973, Cl. 24-205.00R.
Molins Machine Company, Inc.: *See—*
Krebs, Charles, 4,055,257, Cl. 214-6.0DK.
Mollet, Hans: *See—*
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Blaser, Don E.; and Molstedt, Byron V., 4,055,484, Cl. 208-127.000.
Molten Metal Engineering Co.: *See—*
Young, William P., 4,055,390, Cl. 432-14.000.
Mongault, Jacques. Anti-skid device. 4,055,210, Cl. 152-239.000.
Monroe, Thomas D., to Robbins & Myers, Inc. Ventilator apparatus. 4,055,113, Cl. 98-43.00C.
Monsanto Company: *See—*
Chupp, John P., 4,055,414, Cl. 71-111.000.
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Moore, Walter A. Power steering regulation for automobiles. 4,055,232, Cl. 180-132.000.
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Bridgegum, James Earl, 4,054,981, Cl. 29-157.30R.
Mori, Yasuki: *See—*
Tomioka, Shinji; Mori, Yasuki; Nara, Takashi; and Shirahata, Kunikatsu, 4,055,715, Cl. 536-17.000.
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Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Takamatsu, Akira; Inui, Taiji; Tone, Hiroshi; and Morishima, Hajime, 4,055,468, Cl. 195-29.000.
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Frey, Kenneth H., 4,055,106, Cl. 91-495.000.
Morrison, Robert B.: *See—*
Frey, Kenneth H., 4,055,106, Cl. 91-495.000.
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Moses, Lawrence L. Fluid-reservoir hair comb. 4,055,195, Cl. 132-115.000.
Moss, Jack J.: *See—*
Hunt, Archie F.; and Moss, Jack J., 4,055,349, Cl. 273-179.00A.
Motai, Yoichi; Gouda, Keijiro; and Isono, Atsuya, to Nippon Oil Company. Ltd.; and Mirua Shokai Company Ltd. Vessel mooring system. 4,055,137, Cl. 114-230.000.
Motorola, Inc.: *See—*
En, John, 4,055,832, Cl. 340-146.1AQ.
Gay, Michael J., 4,055,818, Cl. 333-28.00T.
Lace, Melvin Arthur, 4,055,288, Cl. 226-1.000.
Priniski, David Joseph; and Meyerhoff, Jerry David, 4,055,807, Cl. 325-21.000.
Movshovich, Pavel Mikhailovich; Maximov, Gennady Konstantinovich; Khavkin, Viktor Pavlovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Afanasiev, Vladimir Konstantinovich; Kudryavtseva, Tamara Nikolaevna; and Nezelenov, Sergei Vladimirovich. Apparatus for obtaining self-twisted product. 4,055,039, Cl. 57-34.0AT.
Muchowski, Joseph M.: *See—*
Ackrell, Jack; and Muchowski, Joseph M., 4,055,574, Cl. 260-327.00B.
Mueller, Roman; and Kalapos, Josef, to Gebrueder Buehler AG. Method of moistening whole grains. 4,055,673, Cl. 426-231.000.
Mueller, Willy: *See—*
Cseh, Georg; and Mueller, Willy, 4,055,559, Cl. 260-176.000.
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Yamaguchi, Toshiaki; Narita, Keizo; and Mukai, Hideo, 4,055,313, Cl. 242-56.400.
Muldrow, Barney P., Jr., to Gulf Oil Corporation. Method of placing blasting charges in wet boreholes. 4,055,122, Cl. 102-23.000.

Mulholland, Thomas Patrick Cunningham: *See—*
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Muller-Bardorff, Wolfgang: *See—*
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Multinorm, B. V.: *See—*
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,055,037, Cl. 56-16.400.

Munday, Basil Sidney, to International Computers Limited. Printing methods and apparatus. 4,055,117, Cl. 101-93.140.

Munson, Robert L., to Rain Bird Sprinkler Mfg. Corporation. Auxiliary braking means for impact arm sprinklers. 4,055,304, Cl. 239-230.000.

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Watanabe, Yasuaki; Okabe, Yukio; Hayakawa, Mitsuru; Ikemura, Yuichi; Fujita, Yasuhiro; and Murakami, Daisuke, 4,055,817, Cl. 331-117.00R.

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Murphy, Kevin P.; and Stahl, Richard F., to Allied Chemical Corporation. Constant boiling mixtures of 1,2-difluoroethane and 1,1,2-trichloro-1,2,2-trifluoroethane. 4,055,049, Cl. 60-651.000.

Murphy, Kevin P.; Stahl, Richard F.; and Orfeo, Sabatino R., to Allied Chemical Corporation. Constant boiling mixtures of dichloromonofluoromethane and 1-chloro-2,2,2-trifluoroethane. 4,055,054, Cl. 62-114.000.

Murphy, Richard F.: *See—*
Chierici, Osvaldo F.; and Murphy, Richard F., 4,055,254, Cl. 213-61.000.

Murtha, Timothy P., to Phillips Petroleum Company. Preparation of o,o′-dihydroxyazobenzenes from o-nitrophenols. 4,055,567, Cl. 260-206.000.

Musgrave, Daniel Dennis. Pistol charging device. 4,055,015, Cl. 42-1.00R.

Mustacchi, Henry, to GAF Corporation. Diazotype material and graphic reproduction processes employing the same. 4,055,425, Cl. 96-49.000.

Myerholtz, Arthur D.: *See—*
Creps, John L.; McEwen, Stephen N.; and Myerholtz, Arthur D., 4,055,497, Cl. 210-91.000.

Myers, Robert Weston: *See—*
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Nachbur, Hermann; and Maeder, Arthur, to Ciba-Geigy Corporation. Process for flameproofing organic fiber material. 4,055,689, Cl. 427-379.000.

Nachman Corporation: *See—*
Laiche, Emile J.; and Jones, Russell E., 4,055,337, Cl. 267-101.000.

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Arya, Vishwa Prakash; and Nagarajan, Kuppuswamy, 4,055,647, Cl. 424-251.000.

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Stefan, Mihaly; Nagy, Tibor; and Daroczi, Sandor, 4,055,415, Cl. 75-74.000.

Nakajima, Fumio; Machida, Takayasu; and Yamada, Kenji. Stepping motor for electronic timepiece. 4,055,785, Cl. 318-138.000.

Nakajima, Sokichi: *See—*
Nakayama, Taisuke; and Nakajima, Sokichi, 4,054,954, Cl. 3-1.000.

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Nakamura, Tadashi: *See—*
Saitoh, Shigeru; Watanabe, Tetsuya; Konno, Koji; and Nakamura, Tadashi, 4,055,623, Cl. 423-235.000.

Nakamura, Tutomu; Sasaki, Takehiko; Yonekawa, Masaji; and Maeda, Hidetoshi, to Sharp Kabushiki Kaisha. Switching assembly in combination wristwatch and calculator. 4,055,755, Cl. 364-705.000.

Nakayama, Taisuke; and Nakajima, Sokichi, to Tokyo Gihatsu Seikei Company Limited. Method of providing hair at the scalp. 4,054,954, Cl. 3-1.000.

Nalco Chemical Company: *See—*
Christensen, Ronald J.; and Zivtins, George J., 4,055,467, Cl. 195-2.000.
Gabel, Robert K.; and Seitz, Paul L., 4,055,495, Cl. 210-52.000.

Nara, Takashi: *See—*
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Narita, Yoshinori: *See—*
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National Institute for Researches in Inorganic Materials: *See—*
Kawai, Shichio; Tanaka, Takaho; Bannai, Eisuke; Uchida, Kenji; and Shimizu, Ryuichi, 4,055,780, Cl. 313-346.00R.

National Instrument Company: *See—*
Rosen, Sidney; and Bennett, Richard Nelson, 4,055,281, Cl. 222-309.000.

National Medical Care, Inc.: *See—*
Friedrich, Richard A.; and MacNeill, Robert L., 4,055,496, Cl. 210-87.000.

National Patent Development Corporation: *See—*
Barer, Sol J.; Valenti, Peter C.; and Marchwinski, Michael, 4,055,663, Cl. 424-319.000.

National Research Laboratories: *See—*
Maurer, Gerald L.; and Shringarpurey, Sudhir K., 4,055,655, Cl. 424-294.000.

National Starch and Chemical Corporation: *See—*
Helmstetter, Gerald J., 4,055,554, Cl. 260-117.000.

Naylor, Neal & Uilkema: *See—*
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Nazarenko, Valentin Vasilievich: *See—*
Ulyanov, Viktor Leonidovich; Shishkarev, Eduard Evgenievich; Nazarenko, Valentin Vasilievich; Yavich, Vladimir Efimovich, deceased; and Yavich, Maria Semenovna, administrator, 4,055,216, Cl. 164-258.000.

Nelson, Norman A., to Upjohn Company, The. 2-Decarboxy-2-hydroxy-methyl-5-oxa-17-phenyl-18,19,20-trinor-PGF-analogs. 4,055,602, Cl. 250-613.00D.

Nelson, Richard Allen. Cable support and locator structure. 4,055,796, Cl. 324-3.000.

Nemoto, Makoto: *See—*
Okamoto, Masahiro; Nemoto, Makoto; Kataoka, Yushin; and Tokugawa, Yoshiharu, 4,055,585, Cl. 260-453.0SP.

Nesvadba, Hans; and Reinshagen, Hellmuth, to Sandoz Ltd. Imidazolyl-2-quinazoline derivatives. 4,055,642, Cl. 424-246.000.

Neuer, Harald: *See—*
Kappe, Walter; Lampe, Gotz-Reinhard; and Neuer, Harald, 4,055,752, Cl. 364-551.000.

New England Envelope Manufacturing Co.: *See—*
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Nezelenov, Sergei Vladimirovich: *See—*
Movshovich, Pavel Mikhailovich; Maximov, Gennady Konstantinovich; Khavkin, Viktor Pavlovich; Ivanov, Lev Nikolaevich; Babushkina, Natalya Borisovna; Afanasiev, Vladimir Konstantinovich; Kudryavtseva, Tamara Nikolaevna; and Nezelenov, Sergei Vladimirovich, 4,055,039, Cl. 57-34.0AT.

NGK Insulators, Ltd.: *See—*
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NGK Spark Plug Co., Ltd.: *See—*
Morikawa, Akira; and Narita, Yoshinori, 4,055,614, Cl. 264-59.000.

Ngu Tung, Pham: *See—*
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Nichibei Fuji Cycle Co., Ltd.: *See—*
Tanaka, Hiroshi; Ogisu, Noriyuki; and Urakawa, Akira, 4,055,235, Cl. 188-24.000.

Niederprum, Hans; Klein, Heinz Gunter; and Meussdoerffer, Johann-Nikolaus, to Bayer Aktiengesellschaft. Etching glass with HF and fluorine-containing surfactant. 4,055,458, Cl. 156-663.000.

Nieman, John R., to Caterpillar Tractor Co. Flash control molding for molds. 4,055,214, Cl. 164-241.000.

Nihon Kogyo Kabushiki Kaisha: *See—*
Okudaira, Shigenori; Takahashi, Mitsuo; Irie, Takefumi; Itoh, Eiji; and Kashiwagi, Koh, 4,055,621, Cl. 423-79.000.

Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See—*
Fujita, Shigemi; and Goto, Masaru, 4,055,618, Cl. 264-141.000.
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Nippon Kayaku Co., Ltd.: *See—*
Hirose, Kiyonobu; Ishida, Shuichi; and Omori, Kaoru, 4,055,640, Cl. 424-230.000.

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Hirose, Kiyonobu; Ishida, Shuichi; and Omori, Kaoru, 4,055,639, Cl. 424-230.000.

Nippon Kogaku K.K.: *See—*
Shimomura, Jun, 4,055,761, Cl. 250-239.000.

Nippon Oil Company, Ltd.: *See—*
Motai, Yoichi; Gouda, Keijiro; and Isono, Atsuya, 4,055,137, Cl. 114-230.000.

Nippondenso Co., Ltd.: *See—*
Sakurai, Yasuhiko; Ishida, Toshio; and Kusumoto, Teruo, 4,055,831, Cl. 340-80.000.

Nishigami, Teiichi, to Maruzen Sewing Machine Co., Ltd. Ornamental stitch sewing machine. 4,055,128, Cl. 112-158.00A.

Nishimura Seisakusho Co., Ltd.: *See—*
Yamaguchi, Toshiaki; Narita, Keizo; and Mukai, Hideo, 4,055,313, Cl. 242-56.400.

Nissan Motor Company, Limited: *See—*
Ogawa, Naoki; and Ikawa, Kazuo, 4,055,375, Cl. 339-6.00R.

Nittetsu Chemical Industrial Co., Ltd.: *See—*
Okamoto, Masahiro; Nemoto, Makoto; Kataoka, Yushin; and Tokugawa, Yoshiharu, 4,055,585, Cl. 260-453.0SP.

Nohmura, Ryotaro. Health promoting apparatus. 4,055,170, Cl. 128-33.000.

Norberg, Lars; and Olsson, Erik, to Stal-Laval Turbin AB. Energy source for large heating systems. 4,055,299, Cl. 237-2.00B.

Norman, Vello; and Bryant, Herman G., Jr., to Liggett & Myers Incorporated. Tobacco composition. 4,055,191, Cl. 131-9.000.

Northrup, Thomas A.: *See—*
Jenkins, Stephen R.; Northrup, Thomas A.; and Stewart, Robert E., 4,055,851, Cl. 364-200.000.

Norton, Richard V., to Suntech, Inc. Ammoxidation of alkyl substituted

organic compounds using a solution of ammonium carbonate as the ammonia source. 4,055,587, Cl. 260-465.00C.
Norwalt Design, Inc.: *See—*
McDonald, Walter; Seitel, Norbert F.; and Burger, Richard A., 4,055,455, Cl. 156-351.000.
Nott, Alan J., to Anglo-American Clays Corporation. Method for improving clay brightness utilizing magnetic separation. 4,055,485, Cl. 209-3.000.
Novak, John D.; and Sell, Joseph W., to Owens-Illinois, Inc. Forehearth homogenization method and apparatus. 4,055,408, Cl. 65-135.000.
November, Milton H., to International Telephone and Telegraph Corporation. Net oil computer. 4,055,082, Cl. 73-194.00R.
Novikov, Oleg Nikolaevich: *See—*
Yakshin, Alexandr Sergeevich; Novikov, Oleg Nikolaevich; Grechinsky, Dmitry Alexeevich; Klochko, Viktor Alexandrovich; and Rygalin, Viktor Georgievich, 4,055,842, Cl. 340-347.0AD.
Numazawa, Akio; Nakamura, Hiroyuki; Kurita, Tokio; Horie, Kouji; and Kondo, Toshio, to Aishin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Disc brake for a vehicle. 4,055,237, Cl. 188-73.400.
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Voss, Charles J.; and Nykiel, Theodore, 4,055,419, Cl. 96-1.0LY.
O'Brien, James Eugene; and Ostapczuk, Edward Walter, to Singer Company, The. Electronic control arrangement for sewing machines. 4,055,131, Cl. 112-158.00E.
Occidental Petroleum Corporation: *See—*
Choi, Charles K.; and Tassoney, Joseph P., 4,055,486, Cl. 209-11.000.
Offermanns, Heribert; and Posselt, Klaus, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Sulfur containing trialkoxybenzoylamino carboxylic acids. 4,055,653, Cl. 424-275.000.
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Galmiche, Philippe M.; and Lepetit, Pierre J., 4,055,706, Cl. 428-652.000.
Ogawa, Junkichi; Ishii, Tsumoru; and Shimamura, Isao, to Fuji Photo Film Co., Ltd. Process for stabilizing a color developing solution. 4,055,426, Cl. 96-66.400.
Ogawa, Naoki; and Ikawa, Kazuo, to Nissan Motor Company, Limited. Electric contacting device. 4,055,375, Cl. 339-6.00R.
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Ohio State University, The: *See—*
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Miller, Don W.; and Gerber, Mark S., 4,055,766, Cl. 250-370.000.
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Ashida, Kaneyoshi; Ohtani, Masaaki; Yokoyama, Takashi; and Ohkubo, Shoichi, 4,055,522, Cl. 260-2.5AW.
Ohta, Masafumi, to Ricoh Co., Ltd. Sensitizer for photoconductive sensitive material. 4,055,421, Cl. 96-1.600.
Ohtani, Masaaki: *See—*
Ashida, Kaneyoshi; Ohtani, Masaaki; Yokoyama, Takashi; and Ohkubo, Shoichi, 4,055,522, Cl. 260-2.5AW.
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Okabe, Yukio: *See—*
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Okamoto, Masahiro; Nemoto, Makoto; Kataoka, Yushin; and Tokugawa, Yoshiharu, to Sumitomo Chemical Company, Limited; and Nittetsu Chemical Industrial Co., Ltd. Preparation of liquid TDI for compositions. 4,055,585, Cl. 260-453.0SP.
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, to Mitsubishi Chemical Industries Ltd.; and Okamoto, Shosuke. N^2-alkoxynaphthalenesulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,055,636, Cl. 424-177.000.
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Okamoto, Shozo, to Yonezawa Toys Co., Ltd. Toy car racer with self-steering mechanism. 4,055,021, Cl. 46-202.000.
Okawa, Taro; and Takeda, Hideichi, to Yoshida Kogyo K.K. Gasket construction. 4,055,031, Cl. 52-172.000.
Okudaira, Shigenori; Takahashi, Mitsuo; Irie, Takefumi; Itoh, Eiji; and Kashiwagi, Koh, to Nihon Kogyo Kabushiki Kaisha. Process for obtaining titanium tetrachloride, chlorine and iron oxide from ilmenite. 4,055,621, Cl. 423-79.000.
Oldrieve, Robert E.; and Blankenship, Charles P., to United States of America, National Aeronautics and Space Administration. Tantalum modified ferritic iron base alloys. 4,055,416, Cl. 75-124.000.
Olig, Eugene A.: *See—*
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Olin Corporation: *See—*
Dotson, Ronald L.; Justice, David D.; and Kuo, Han C., 4,055,475, Cl. 204-98.000.
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Olthoff, James A.: *See—*
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Optical Coating Laboratory, Inc.: *See—*
Crosher, Frederick K., 4,055,442, Cl. 136-89.0CC.
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Orfeo, Sabatino R.: *See—*
Murphy, Kevin P.; Stahl, Richard F.; and Orfeo, Sabatino R., 4,055,054, Cl. 62-114.000.
Original Hanau Quarzlampen GmbH: *See—*
Schafer, Jurgen, 4,055,779, Cl. 313-220.000.
Orlandi, John Victor; Poley, Neil Myron; and Wilson, Donald Miller, to International Business Machines Corporation. Electric tip-off heat sink. 4,055,219, Cl. 219-390.000.
Orlova, Ljudmila Alexeevna: *See—*
Pavlushkin, Nikolai Mikheevich; Bondarev, Konstantin Timofeevich; Strekalov, Anatoly Vasilievich; Kozlovsky, Viktor Stepanovich; Minakov, Anatoly Gavrilovich; Golius, Tamara Efimovna; Orlova, Ljudmila Alexeevna; Sarkisov, Pavel Dzhibraelovich; Kozmin, Mikhail Ivanovich; and Minakov, Vladimir Anatolievich, 4,055,436, Cl. 106-52.000.
Oroshnik, William: *See—*
Close, Ralph E.; and Oroshnik, William, 4,055,575, Cl. 260-345.500.
Osofsky, Irving B.; and Thompson, Hugh C., to McDonnell Douglas Corporation. Tire piercing munition. 4,055,104, Cl. 89-1.00A.
Ostapczuk, Edward Walter: *See—*
O'Brien, James Eugene; and Ostapczuk, Edward Walter, 4,055,131, Cl. 112-158.00E.
Ostrem, Obert M.; Kulikowski, Donald F.; and Pulciani, Sam C., to Continental Group, Inc., The. Edge protection for easy opening end closure. 4,055,134, Cl. 113-121.00C.
Ostrozynski, Robert Leopold: *See—*
Taub, Bernard; and Ostrozynski, Robert Leopold, 4,055,521, Cl. 260-2.5AF.
Outboard Marine Corporation: *See—*
Kidd, Earl H., 4,055,036, Cl. 56-13.600.
Owego Heat Treat, Inc.: *See—*
Engelhard, William E., 4,055,333, Cl. 266-130.000.
Owens-Corning Fiberglas Corporation: *See—*
Slonaker, Robert O.; and Emerson, Jack L., 4,055,406, Cl. 65-11.00W.
Owens-Illinois, Inc.: *See—*
Novak, John D.; and Sell, Joseph W., 4,055,408, Cl. 65-135.000.
Taylor, Lynn Johnston; and Troy, Henry Neal, 4,055,441, Cl. 134-10.000.
Owner, Donald Bruce: *See—*
Chipper, John Lester; and Owner, Donald Bruce, 4,055,316, Cl. 244-33.000.
Ozaki, Masahiko: *See—*
Sawanishi, Shigeru; Ozaki, Masahiko; and Katagawa, Kikuji, 4,055,493, Cl. 210-31.00C.
Oztekin, Muammer A. Merchandise display unit. 4,055,253, Cl. 211-189.000.
Pacher, Marielise: *See—*
Koller, Stefan; Pacher, Marielise; and Emmenegger, Karl, 4,055,392, Cl. 8-21.00C.
Pai, Damodar M.: *See—*
Limburg, William W.; and Pai, Damodar M., 4,055,420, Cl. 96-1.50N.
Pallo, John Matthew: *See—*
Chen, Alwin Bennett; and Pallo, John Matthew, 4,055,434, Cl. 106-50.000.
Palzer, Augustine M. Roofing apparatus. 4,055,384, Cl. 401-48.000.
Panandiker, K. A. Pai; and Tweet, David E., to Cargill, Incorporated. Continuous process for the production of partially blocked isocyanates. 4,055,550, Cl. 260-77.5AA.
Panandiker, K. A. Pai; and Tweet, David E., to Cargill, Incorporated. Continuous process for the production of blocked isocyanates. 4,055,551, Cl. 260-77.5AA.
Panousis, Peter Theodore; Pritchett, Robert Leonard; and Smits, Frie-

dolf Michael, to Bell Telephone Laboratories, Incorporated. Electrical identification of multiply configurable circuit array. 4,055,802, Cl. 324-73.0AT.

Parke, Davis & Company: *See—*
Baker, David Clarkston; and Haskell, Theodore Herbert, 4,055,717, Cl. 536-26.000.
Baker, David Clarkston, 4,055,718, Cl. 536-26.000.

Parker, Alfred B.: *See—*
Scragg, Robert L.; and Parker, Alfred B., 4,055,165, Cl. 126-400.000.

Parker, Leland L. Filtering apparatus and quick-opening backwash valve therefor. 4,055,500, Cl. 210-412.000.

Parr, Norman Lawrence: *See—*
Cockbain, Alan Gray; Latimer, Michael John; and Parr, Norman Lawrence, 4,055,451, Cl. 156-89.000.

Parrish, David R., to Standard Oil Company (Indiana). Tracers in predetermined concentration ratios. 4,055,399, Cl. 23-230.0EP.

Patel, Bhupendra C.; Binard, William J.; and McWhorter, Daniel M., to Kendall Company, The. Catheter with improved balloon assembly. 4,055,187, Cl. 128-349.00B.

Patel, Harshad M. Integrated circuit substitution device. 4,055,806, Cl. 324-158.00F.

Patsch, Manfred; and Vamvakaris, Christos, to BASF Aktiengesellschaft. Dyes of the coumarin series. 4,055,568, Cl. 260-302.00H.

Patterson, Michael P. Star ornament and card. 4,055,690, Cl. 428-9.000.

Pauling, Horst: *See—*
Brenner, Wolf; Erlemann, Gustav; and Pauling, Horst, 4,055,634, Cl. 424-47.000.

Pauluis, Gerard J.; and Miller, Alistair I., to Atomic Energy of Canada Limited. Dual temperature isotope exchange processes. 4,055,398, Cl. 23-270.50W.

Pavlushkin, Nikolai Mikheevich; Bondarev, Konstantin Timofeevich; Strekalov, Anatoly Vasilievich; Kozlovsky, Viktor Stepanovich; Minakov, Anatoly Gavrilovich; Golius, Tamara Efimovna; Orlova, Ljudmila Alexeevna; Sarkisov, Pavel Dzhibraelovich; Kozmin, Mikhail Ivanovich; and Minakov, Vladimir Anatolievich. Glass for manufacturing white-colored glass-crystalline material. 4,055,436, Cl. 106-52.000.

Payer, Wolfgang: *See—*
Feichtinger, Hans; Payer, Wolfgang; Cornils, Boy; and Weber, Jurgen, 4,055,586, Cl. 260-465.50R.

Pecoraro, George A.: *See—*
Heithoff, Robert B.; and Pecoraro, George A., 4,055,407, Cl. 65-27.000.

Pelton, Robert J., to Divajex. Therapeutic wrap. 4,055,188, Cl. 128-402.000.

Pendock, Walter E. Metal picture hanger. 4,055,319, Cl. 248-491.000.

Penet, Alain: *See—*
Milcamps, Jacques; and Penet, Alain, 4,055,770, Cl. 250-505.000.

Pennsylvania Engineering Corporation: *See—*
Fisher, Howard M., 4,055,335, Cl. 266-245.000.

Pennwalt Corporation: *See—*
Sheppard, Chester S.; and MacLeay, Ronald E., 4,055,714, Cl. 526-208.000.

Pennzoil Company: *See—*
Drechsel, Erhart Karl; and Sardisco, John B., 4,055,626, Cl. 423-320.000.
Kidwell, Louis E., Jr., 4,055,481, Cl. 208-89.000.

Perkin-Elmer Corporation, The: *See—*
Sibrava, Joseph, 4,055,259, Cl. 214-17.00A.

Perkins, Charles H., to Robertshaw Controls Company. Reversible refrigerant system and four-way reversing valve therefor or the like. 4,055,056, Cl. 62-324.000.

Perklev, Torsten: *See—*
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,055,638, Cl. 424-219.000.

Pertec Computer Corporation: *See—*
Abraham, Robert C.; and Cline, James E. D., 4,055,814, Cl. 331-1.00A.

Perusse, Eugene T.: *See—*
Ickes, Charles M.; and Perusse, Eugene T., 4,055,794, Cl. 323-22.00T.

Peska, Jan; Stamberg, Jiri; and Blace, Zdenko, to Ceskoslovenska akademie ved. Method for manufacturing of spherical cellulose particles. 4,055,510, Cl. 252-426.000.

Peters, Edward J., to Diamond Shamrock Corporation. Explosion bonding of bipolar electrode backplates. 4,055,291, Cl. 228-108.000.

Peters, Palmer N.: *See—*
United States of America, National Aeronautics and Space Administration; Holderman, Louis B.; and Peters, Palmer N., 4,055,847, Cl. 357-5.000.

Peterson, Donald J., to Procter & Gamble Company, The. Novel organotin herbicidal compounds. 4,055,413, Cl. 71-97.000.

Peterson, Glen. Method of and apparatus for securing and storing personal information. 4,055,746, Cl. 235-61.70B.

Petitpierre, Jean Claude: *See—*
Garner, Robert; and Petitpierre, Jean Claude, 4,055,358, Cl. 282-27.500.

Petrak, Daniel Ralph, to Dresser Industries, Inc. Method of in situ fabrication of a monolithic refractory lining. 4,055,437, Cl. 106-64.000.

Petrocci, Alfonso N.: *See—*
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,055,712, Cl. 526-11.100.

Petrolite Corporation: *See—*
Wilson, Homer M., 4,055,478, Cl. 204-195.00T.

Petrow, Vladimir: *See—*
Benson, Harvey D.; Grunwell, Joyce Francis; Johnston, John O'Neal; and Petrow, Vladimir, 4,055,641, Cl. 424-242.000.

Pettit, Dorothy E.: *See—*
Pettit, John E.; and Pettit, Dorothy E., 4,054,960, Cl. 5-357.000.

Pettit, John E.; and Pettit, Dorothy E. Inflatable body support cushion, particularly to support a woman during pregnancy. 4,054,960, Cl. 5-357.000.

Petty, Walter L.: *See—*
Hunter, Leon; and Petty, Walter L., 4,055,516, Cl. 260-2.00A.

Phelps, Harold E., to Harold Phelps, Inc. Carburetor and fuel supply system. 4,055,609, Cl. 261-36.00A.

Phillips Petroleum Company: *See—*
Fahey, Darryl R., 4,055,582, Cl. 260-439.00R.
Moczygemba, George A.; Johnson, W. Delmar; and Clark, Earl, 4,055,713, Cl. 526-207.000.
Murtha, Timothy P., 4,055,567, Cl. 260-206.000.
Swanson, Billy L., 4,055,502, Cl. 252-8.55C.

Piber, Earl T., to Cutler-Hammer, Inc. Lighted toggle lever switch. 4,055,739, Cl. 200-315.000.

Pieton, James L., to McEsco Inc. Portable blast furnace slag beneficiating plant. 4,055,251, Cl. 209-38.000.

Piironen, Pekka Elis: *See—*
Huhta-Koivisto, Esko; and Piironen, Pekka Elis, 4,055,018, Cl. 43-42.480.

Pike, Harold L.; Thomas, G. Lamar; Ketchum, Ronald L.; and Evans, John F. Automatic electronic test equipment and method. 4,055,801, Cl. 324-73.00R.

Pilwat, Gunter: *See—*
Coster, Hans; Pilwat, Gunter; and Zimmermann, Ulrich, 4,055,799, Cl. 324-71.00R.

Pinney, Wesley W.: *See—*
Mahaffy, Reid A.; Hamilton, Joel A.; and Pinney, Wesley W., 4,055,671, Cl. 426-123.000.

Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, to International Flavors & Fragrances Inc. Novel fragrance compositions and perfumed articles containing alpha-substituted acetaldehyde. 4,055,506, Cl. 252-132.000.

Planke, Tore. Method and a device for automatic pattern recognition of liquid containers. 4,055,834, Cl. 340-146.30F.

Plastronics, Inc.: *See—*
Manschot, James Gordon; and Mather, Byron L., 4,055,179, Cl. 128-275.000.

Platonova, Ada Timofeevna: *See—*
Voronkov, Mikhail Grigorievich; Platonova, Ada Timofeevna; Mansurova, Ljudmila Andreevna; Kuznetsov, Igor Georgievich; Zelchan, Gunar Izidorovich; and Dyakov, Valery Mikhailovich, 4,055,637, Cl. 424-184.000.

Plummer, Harvey R., to Giddings & Lewis. Inc. Block type cutting tool with positive clamp for insert blades. 4,054,977, Cl. 407-108.000.

Podhorsky, Miroslav: *See—*
Krips, Herbert; and Podhorsky, Miroslav, 4,055,063, Cl. 72-62.000.

Poley, Neil Myron: *See—*
Orlandi, John Victor; Poley, Neil Myron; and Wilson, Donald Miller, 4,055,219, Cl. 219-390.000.

Polychrome Corporation: *See—*
Chu, Simon L.; Sharowsky, Robert; and Shu, Peter, 4,055,144, Cl. 118-401.000.

Pomeschikov, Andrei Grigorievich: *See—*
Lukyanov, Jury Sergeevich; Kazantsev, Lev Seliverstovich; Pomeschikov, Andrei Grigorievich; and Skvortsov, Gennady Fedorovich, 4,055,722, Cl. 13-16.000.

Poppe, Wassily; and Fielding, Ivor R., to Standard Oil Company (Indiana). Aqueous dispersion of addition polymer of an alpha-beta-ethylenically unsaturated monomer and suspended polypropylene particles. 4,055,530, Cl. 260-29.6RW.

Poppe, Wassily W.; and Inskeep, Mark D., to Standard Oil Company (Indiana). Dyeable polypropylene containing bisulfate. 4,055,608, Cl. 260-857.00L.

Popper, Karel; Schultz, William G.; Camirand, Wayne M.; Hautala, Earl; Robertson, George H.; Crawford, Ladell; and Finkle, Bernard J., to United States of America, Agriculture. Preparation of puffed fruit. 4,055,675, Cl. 426-470.000.

Pops, Horace, to Essex International, Inc. Method for fabrication of brass alloy. 4,055,445, Cl. 148-11.50C.

Porath-Furedi, Asher. Apparatus and method for removing fine particles from a liquid medium by ultrasonic waves. 4,055,491, Cl. 210-19.000.

Posselt, Klaus: *See—*
Offermanns, Heribert; and Posselt, Klaus, 4,055,653, Cl. 424-275.000.

Potomac Applied Mechanics, Inc.: *See—*
Stubbings, James Henry, 4,055,102, Cl. 83-749.000.

Potter, James Charles, to CAV Limited. Liquid fuel injection pumping apparatus. 4,055,387, Cl. 417-221.000.

Pouring, Andrew A.: *See—*
Jasperson, Robert E.; Erb, Charles G.; Haber, Donald F.; and Pouring, Andrew A., 4,055,121, Cl. 102-14.000.

PPG Industries, Inc.: *See—*
Heithoff, Robert B.; and Pecoraro, George A., 4,055,407, Cl. 65-27.000.
Johnson, Harlan B., 4,055,477, Cl. 204-98.000.
Jozwiak, Edward L., Jr.; and Das, Suryya K., 4,055,527, Cl. 260-23.70A.
Rinehart, Dale W., 4,055,703, Cl. 428-410.000.
Rinehart, Jay K., 4,055,657, Cl. 424-300.000.

Rinehart, Jay Kent, 4,055,656, Cl. 424-300.000.
Sullivan, Thomas R.; Christenson, Roger M.; Das, Suryya K.; and Dowbenko, Rostyslaw, 4,055,607, Cl. 260-851.000.
Prakash, Sri, to Union Carbide Corporation. Capacitor with electrode containing nickel. 4,055,850, Cl. 361-305.000.
Precision Monolithics, Inc.: *See*—
Schoeff, John A., 4,055,773, Cl. 307-229.000.
Pressman, Barry M.: *See*—
Kraley, Raymond L.; Pressman, Barry M.; and Chana, Maghar S., 4,055,803, Cl. 324-142.000.
Prevorsek, Dusan C.; and Aharoni, Shaul M., to Allied Chemical Corporation. Novel copolyester-polyepoxide compositions. 4,055,606, Cl. 260-835.000.
Price, Jean L.: *See*—
Jeffreys, George A.; Price, Jean L.; and Tobey, James F., 4,055,666, Cl. 426-31.000.
Priniski, David Joseph; and Meyerhoff, Jerry David, to Motorola, Inc. Antenna switch. 4,055,807, Cl. 325-21.000.
Pritchett, Robert Leonard: *See*—
Panousis, Peter Theodore; Pritchett, Robert Leonard; and Smits, Friedolf Michael, 4,055,802, Cl. 324-73.0AT.
Probe Rite, Inc.: *See*—
Ardezzone, Frank J., 4,055,805, Cl. 324-158.00P.
Procter & Gamble Company, The: *See*—
Marsan, Mario S., 4,055,248, Cl. 206-.500.
Peterson, Donald J., 4,055,413, Cl. 71-97.000.
Prolizenz AG: *See*—
Schmidt, Walter; and Stahlin, Walter, 4,055,391, Cl. 432-264.000.
Pruitt, Kenneth R., Sr.: *See*—
Kelly, Ray G.; Pruitt, Kenneth R., Sr.; and Kershman, Alvin L., 4,055,669, Cl. 426-93.000.
Pulciani, Sam C.: *See*—
Ostrem, Obert M.; Kulikowski, Donald F.; and Pulciani, Sam C., 4,055,134, Cl. 113-121.00C.
Putsch, Ulrich; and Klingelhofer, Gerd, to Keiper K.G. Lockable, adjustable hinge for motor-vehicle seat. 4,054,966, Cl. 16-143.000.
Quakenbush, Howard M. Foldable bunk bed assembly. 4,054,956, Cl. 5-9.00R.
Quaker Oats Company, The: *See*—
Balaz, Alexander; Bone, David P.; and Shannon, Edward L., 4,055,681, Cl. 426-656.000.
Foulkes, Peter H., 4,055,676, Cl. 426-532.000.
Quinn, Edwin J.: *See*—
Dieck, Ronald L.; and Quinn, Edwin J., 4,055,520, Cl. 260-2.50R.
Dieck, Ronald L.; Magnusson, Alan B.; and Quinn, Edwin J., 4,055,523, Cl. 260-2.50R.
Dieck, Ronald L.; and Quinn, Edwin J., 4,055,545, Cl. 260-47.00P.
R. A. Pearson Co.: *See*—
Graham, Robert H., 4,055,110, Cl. 93-49.00R.
Radnoti, Desmond Arpad. Selective filtration apparatus. 4,055,498, Cl. 210-94.000.
Rain Bird Sprinkler Mfg. Corporation: *See*—
Munson, Robert L., 4,055,304, Cl. 239-230.000.
Rain Jet Corporation: *See*—
Hruby, John O., Jr., 4,055,301, Cl. 239-101.000.
Hruby, John O., Jr., 4,055,302, Cl. 239-102.000.
Hruby, John O., Jr., 4,055,306, Cl. 239-601.000.
Raisin, Jean-Pierre A.; and Bernardot, Andre R., to Centre Technique Industriel dit Institut Textile de France. Apparatus for introducing fabric article parts to an assembling machine. 4,055,244, Cl. 198-345.000.
Ralph M. Parsons Company, The: *See*—
Beavon, David K.; and Jirus, Earl J., 4,055,401, Cl. 23-277.00C.
Ramacciotti, Aldo; and Repetto, Eugenio, to Centro Sperimentale Metallurgico S.p.A. Hot-top for the production of ingots using an electroslag remelting process. 4,055,215, Cl. 164-252.000.
Ramsbottom, John M.: *See*—
Hirsch, Arthur; Spiegel, Francis X.; and Ramsbottom, John M., 4,055,672, Cl. 426-127.000.
Rao, G. R. Mohan, to Texas Instruments Incorporated. Method of making N-channel MOS integrated circuits. 4,055,444, Cl. 148-1.500.
Rasmussen, Harry R., to Crest Industries, Inc. Terminal block assembly for mounting a switch or other electrical component. 4,055,737, Cl. 200-51.00R.
Ravenscroft, Philip H.: *See*—
Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., 4,055,702, Cl. 428-398.000.
Raymond Lee Organization, Inc., The: *See*—
Bell, Heather, 4,055,008, Cl. 40-104.190.
Raymond, Robert E., to De Laval Turbine Inc. Electro-proportional pressure control apparatus. 4,055,197, Cl. 137-84.000.
RCA Corporation: *See*—
Ahmed, Adel Abdel Aziz, 4,055,774, Cl. 307-296.00R.
Bartolini, Robert Alfred; and Bloom, Allen, 4,055,423, Cl. 96-27.00H.
Jellinek, Ernest, 4,055,750, Cl. 364-424.000.
Rosenthal, Bruce David, 4,055,812, Cl. 330-253.000.
Weimer, Paul Kessler, 4,055,836, Cl. 340-173.00R.
Wheatley, Carl Franklin, Jr., 4,055,811, Cl. 330-289.000.
Reagan, Harold D.: *See*—
Freeman, John W.; Jones, Thomas M.; and Reagan, Harold D., 4,054,978, Cl. 29-157.10R.
Reed, Charles W. Apparatus and method for side stream demineralization of condensate in a steam cycle. 4,055,048, Cl. 60-646.000.
Reflex Mobelpflegemittel-Erzeugung Konrad Schischlik & Sohne: *See*—
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Reichhold Chemicals, Inc.: *See*—
Hadgraft, Robert B.; and Martin, John J., 4,055,694, Cl. 428-95.000.
Reid, Angus Joseph Dickson: *See*—
Battersby, John; Forbes, Eric Simon; and Reid, Angus Joseph Dickson, 4,055,402, Cl. 44-58.000.
Reinshagen, Hellmuth: *See*—
Ascher, Gerd; and Reinshagen, Hellmuth, 4,055,646, Cl. 424-250.000.
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Repetto, Eugenio: *See*—
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Reymore, Harold E., Jr.: *See*—
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Richards, Louis R.: *See*—
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Richardson-Merrell Inc.: *See*—
Benson, Harvey D.; Grunwell, Joyce Francis; Johnston, John O'Neal; and Petrow, Vladimir, 4,055,641, Cl. 424-242.000.
Grisar, J. Martin; Claxton, George P.; and MacKenzie, Robert D., 4,055,561, Cl. 260-239.00B.
Ricoh Co., Ltd.: *See*—
Ohta, Masafumi, 4,055,421, Cl. 96-1.600.
Ries, Douglas A., to Ring, Edward M., a part interest. Splint. 4,055,171, Cl. 128-87.00R.
Riew, Changkiu Keith, to B. F. Goodrich Company, The. Reaction products of non-cycloaliphatic epoxy resins and amine-terminated liquid polymers and process for preparation thereof. 4,055,541, Cl. 260-47.0EN.
Riihimaki, Arnold: *See*—
Benezra, Leo L.; Hill, David W.; Riihimaki, Arnold; and Tsai, Shan-Pu, 4,055,476, Cl. 204-98.000.
Rinderle, Heinz, to Licentia Patent-Verwaltungs-G.m.b.H. Tuning circuit arrangement. 4,055,822, Cl. 334-15.000.
Rinehart, Dale W., to PPG Industries, Inc. Ion exchange strengthened glass containing P_2O_5. 4,055,703, Cl. 428-410.000.
Rinehart, Jay K., to PPG Industries, Inc. Methods for controlling fungi. 4,055,657, Cl. 424-300.000.
Rinehart, Jay Kent, to PPG Industries, Inc. Method of controlling pea aphids. 4,055,656, Cl. 424-300.000.
Ring, Edward M.: *See*—
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Riseman, Jacob: *See*—
Ho, Irving T.; and Riseman, Jacob, 4,054,989, Cl. 29-571.000.
Ritchie, Gordon J.: *See*—
Turner, John A.; and Ritchie, Gordon J., 4,055,726, Cl. 178-18.000.
Rixon, John Albert: *See*—
Last, Anthony Graham Marshall; and Rixon, John Albert, 4,055,695, Cl. 428-195.000.
RJR Foods, Inc.: *See*—
Belmont, Edward Bruce, 4,055,670, Cl. 426-119.000.
Robbins & Myers, Inc.: *See*—
Monroe, Thomas D., 4,055,113, Cl. 98-43.00C.
Robert Bosch G.m.b.H.: *See*—
Anselment, Wolfgang; and Gritschmeier, Walter, 4,055,503, Cl. 252-12.000.
Binder, Georg, 4,055,778, Cl. 310-89.000.
Gehring, Thilo; and Berger, Heinz, 4,055,157, Cl. 123-117.00R.
Roberts, Arnold E.; and Harshman, Jack D., to Emerson Electric Co. Counting and printing mechanism with interchangeable unit printer wheel. 4,055,116, Cl. 101-79.000.
Roberts, David M.; and Sever, James A. Portable football dryer. 4,055,002, Cl. 34-104.000.
Roberts, Rene, to Union Carbide Corporation. Thermoplastically processable polyurethanes based on tolylene diisocyanate. 4,055,549, Cl. 260-77.5AN.
Robertshaw Controls Company: *See*—
Bauer, Werner R., 4,055,828, Cl. 337-308.000.
Manecke, Siegfried E.; and Shaw, James L., 4,055,724, Cl. 174-66.000.
Massey, Arie F., Jr., 4,054,979, Cl. 29-157.10R.
Perkins, Charles H., 4,055,056, Cl. 62-324.000.
Sanders, William J., 4,055,326, Cl. 251-351.000.
Robertson, George H.: *See*—
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Robertson, George Heddle: *See*—
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Robitaille, Kenneth L.: *See*—
Gatland, Geoffrey H.; and Robitaille, Kenneth L., 4,055,023, Cl. 49-28.000.
Robson, Harry E., to Exxon Research & Engineering Co. Hydrocracking process with rejuvenated catalyst. 4,055,482, Cl. 208-111.000.
Rockefeller University, The: *See*—
Miller, Neal E.; and Dworkin, Barry R., 4,055,168, Cl. 128-2.00S.
Rockwell International Corporation: *See*—
Daberko, Gunter W., 4,055,376, Cl. 350-10.000.

Rogers, Robert M.; and Boshinski, Edwin E., to Hobart Corporation. Computing weighing scale. 4,055,753, Cl. 364-466.000.
Rogers, Robert M.: *See*—
Boshinski, Edwin E.; Meckstroth, Robert C.; and Rogers, Robert M., 4,055,748, Cl. 364-466.000.
Rohde, Wolfgang: *See*—
Beck, Kurt-Gunther; Rohde, Wolfgang; Habermehl, Diethard; and Siebert, Werner, 4,055,471, Cl. 201-20.000.
Rohm GmbH: *See*—
Gruber, Wilhelm; and Schroeder, Guenter, 4,055,590, Cl. 560-179.000.
Rohr Industries, Incorporated: *See*—
Ickes, Charles M.; and Perusse, Eugene T., 4,055,794, Cl. 323-22.00T.
Rolls-Royce Limited: *See*—
Colley, Rowan Herbert, 4,055,042, Cl. 60-226.00R.
Roma, Carlo, to Square S.A. Process for manufacturing modular elements and a tube nest for heat exchangers. 4,054,980, Cl. 29-157.30R.
Romey, Ingo: *See*—
Kolling, Georg; and Romey, Ingo, 4,055,583, Cl. 423-447.400.
Ronnquist, Axel Georg; Lindahl, Erik Tommie; and Stoilov, Nicolay Stefanov, to Lumalampan AB. Thin composite wire saw with surface cutting crystals. 4,055,700, Cl. 428-366.000.
Rorer Italiana S.p.A.: *See*—
Bertelli, Aldo, 4,055,580, Cl. 260-404.500.
Rosen, Sidney; and Bennett, Richard Nelson, to National Instrument Company. Filling unit with air-operated spool valve system. 4,055,281, Cl. 222-309.000.
Rosenberger, Siegfried, to Ciba-Geigy Corporation. Alkylidene-bisphenols containing sulphur, and their use as stabilizers. 4,055,539, Cl. 260-45.95C.
Rosenhahn, Lothar: *See*—
Bergthaller, Peter; Himmelmann, Wolfgang; Sauerteig, Wolfgang; and Rosenhahn, Lothar, 4,055,427, Cl. 96-67.000.
Rosenthal, Bruce David, to RCA Corporation. Current subtractor. 4,055,812, Cl. 330-253.000.
Rosenthal, Rudolph; and Shawl, Edward T., to Atlantic Richfield Company. Process for the removal of selenium compounds from urethane solutions. 4,055,629, Cl. 423-509.000.
Ross, Haldon, to AMF Incorporated. 10-Speed bicycles. 4,055,093, Cl. 74-501.00R.
Rossomakho, Yakov Vulfovich: *See*—
Bykhovsky, David Grigorievich; Medvedev, Alexandr Yakovlevich; Bogorodsky, Jury Alexandrovich; Firsov, Vladimir Nikolaevich; and Rossomakho, Yakov Vulfovich, 4,055,741, Cl. 219-121.00P.
Roth, Herbert R.: *See*—
Kreighbaum, William E.; Matier, William L.; and Roth, Herbert R., 4,055,658, Cl. 424-304.000.
Rothfjell, Rolf Eric. Method of deriving characteristic contours from a colored picture. 4,055,833, Cl. 340-146.30E.
Rouyer, Hubert: *See*—
Faugeras, Pierre; Lecoq, Pierre; Miquel, Pierre; Rouyer, Hubert; and Simonet, Guy, 4,055,625, Cl. 423-262.000.
Rowe, Sylvester J. Planter. 4,055,022, Cl. 47-79.000.
Rowell, Ross Fredrick. Brassiere fastener. 4,054,972, Cl. 24-201.0HE.
Ruegsegger, Donald Ray, to Elsie Manufacturing Company. Fusible links and process for producing same. 4,055,829, Cl. 337-416.000.
Ruhrchemie Aktiengesellschaft: *See*—
Feichtinger, Hans; Payer, Wolfgang; Cornils, Boy; and Weber, Jurgen, 4,055,586, Cl. 260-465.50R.
Runte, Donald J. Earth moving implement with adjustable wheel assembly. 4,055,222, Cl. 172-413.000.
Rupilius, Wolfgang; and Stein, Werner, to Henkel Kommanditgesellschaft auf Aktien. Process for the extraction of heavy metals from diluted aqueous heavy metal salt solutions. 4,055,492, Cl. 210-21.000.
Russi, Bartello C. Security lock. 4,055,360, Cl. 292-228.000.
Ryan, Arthur Sensor; and Van Vliet, Raymond August, to Weyerhaeuser Company. Disposable diaper with cutout pad at tape attachment area. 4,055,183, Cl. 128-287.000.
Rygalin, Viktor Georgievich: *See*—
Yakshin, Alexandr Sergeevich; Novikov, Oleg Nikolaevich; Grechinsky, Dmitry Alexeevich; Klochko, Viktor Alexandrovich; and Rygalin, Viktor Georgievich, 4,055,842, Cl. 340-347.0AD.
Ryusyo Industrial Co., Ltd.: *See*—
Kawahara, Akira, 4,054,971, Cl. 24-68.0CD.
S. C. Johnson & Son, Inc.: *See*—
Morones, Ricardo, 4,055,433, Cl. 106-10.000.
S I G Schweizerische Industrie-Gesellschaft: *See*—
Kopp, Georg, 4,055,668, Cl. 426-79.000.
S.S.S. Patents Limited: *See*—
Clements, Herbert Arthur; and Heybourne, Robert Howard, 4,055,240, Cl. 192-67.00A.
Sache, Edgar, to Choay S.A. Papaverine thienyl-carboxylates and medicaments containing them. 4,055,648, Cl. 424-260.000.
Sachsel, George F.: *See*—
Stambaugh, Edgel P.; and Sachsel, George F., 4,055,400, Cl. 44-1.00R.
Sack, Georges H., to Johnson & Johnson. Method and apparatus for altering the rigidity of webs by oscillation. 4,055,003, Cl. 34-155.000.
Saffran, Helmut; and Sterck, Lothar, to Davy Powergas GmbH. Process for thermal treatment of crude phthalic acid. 4,055,577, Cl. 260-346.700.
Saga, Katumi: *See*—
Yoshida, Hiroyuki; and Saga, Katumi, 4,055,624, Cl. 423-235.000.
Sagara, Hiroji, to Hoya Glass Works, Ltd. Glass compositions for ophthalmic lenses. 4,055,435, Cl. 106-52.000.
Sagaser, Thomas M.: *See*—
Bauer, James J.; Albright, Larry E.; Werner, James L.; Sagaser, Thomas M.; and Hoechst, Lonnie D., 4,055,262, Cl. 214-140.000.
Saito, Tsutomu, to Three Bond Co., Ltd. Anaerobically curable sealing composition containing (A) acrylate derivative of bisphenol A and (B) hydroxyacrylate. 4,055,542, Cl. 260-47.0UA.
Saitoh, Shigeru; Watanabe, Tetsuya; Konno, Koji; and Nakamura, Tadashi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method of removing nitrogen oxides from a gas as a salt of imidodisulfonic acid. 4,055,623, Cl. 423-235.000.
Sakaguchi, Shokichi: *See*—
Kiyokawa, Shin; Sakaguchi, Shokichi; and Takeuchi, Toru, 4,055,526, Cl. 264-22.000.
Sakellaris, Peter C.: *See*—
United States of America, National Aeronautics and Space Administration; and Sakellaris, Peter C., 4,055,147, Cl. 119-72.500.
Sakurai, Yasuhiko; Ishida, Toshio; and Kusumoto, Teruo, to Nippondenso Co., Ltd. System for indicating interruption in operation of automotive lamps. 4,055,831, Cl. 340-80.000.
Salguero, Hugo A. Teran, to Gundlach, S.A. Rotary engine. 4,055,156, Cl. 123-8.330.
Salter Housewares Limited: *See*—
Ackeret, Peter, 4,055,308, Cl. 241-100.000.
Sandahl, Joel E.: *See*—
Stapleford, Gary N.; and Sandahl, Joel E., 4,055,730, Cl. 179-84.0VF.
Sandberg, Glenn A.; Richards, Louis R.; and Stoub, James W., to Formax, Inc. Food patty molding machine. 4,054,967, Cl. 17-32.000.
Sander, Conrad. Method and apparatus for curing, a coating on a substrate. 4,055,769, Cl. 250-492.00R.
Sanders, Duane: *See*—
Crawford, G. Roger; Sanders, Duane; and Shill, David B., 4,055,203, Cl. 141-73.000.
Sanders, William J., to Robertshaw Controls Company. Needle valve member for a control device and method of making the same. 4,055,326, Cl. 251-351.000.
Sandoz, Inc.: *See*—
Bennett, Gregory B., 4,055,643, Cl. 424-249.000.
Hardtmann, Goetz E.; and Coppola, Gary M., 4,055,566, Cl. 260-295.00A.
Houlihan, William J., 4,055,644, Cl. 260-250.0AH.
Simpson, William R.; and Strohschein, Robert J., 4,055,649, Cl. 424-263.000.
Sandoz Ltd.: *See*—
Aeberli, Max, 4,055,556, Cl. 260-152.000.
Ascher, Gerd; and Reinshagen, Hellmuth, 4,055,646, Cl. 424-250.000.
Nesvadba, Hans; and Reinshagen, Hellmuth, 4,055,642, Cl. 424-246.000.
Sankyo Company Limited: *See*—
Soma, Nobuo; Yoshioka, Takao; Kurumada, Tomoyuki; and Morimura, Syoji, 4,055,536, Cl. 260-45.80N.
Sanraku-Ocean Co., Ltd.: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Takamatsu, Akira; Inui, Taiji; Tone, Hiroshi; and Morishima, Hajime, 4,055,468, Cl. 195-29.000.
Sardisco, John B.: *See*—
Drechsel, Erhart Karl; and Sardisco, John B., 4,055,626, Cl. 423-320.000.
Sargisson, Donald F.: *See*—
Adamson, Arthur P.; Sargisson, Donald F.; and Stotler, Charles L., Jr., 4,055,041, Cl. 60-226.00R.
Sarkisov, Pavel Dzhibraelovich: *See*—
Pavlushkin, Nikolai Mikheevich; Bondarev, Konstantin Timofeevich; Strekalov, Anatoly Vasilievich; Kozlovsky, Viktor Stepanovich; Minakov, Anatoly Gavrilovich; Golius, Tamara Efimovna; Orlova, Ljudmila Alexeevna; Sarkisov, Pavel Dzhibraelovich; Kozmin, Mikhail Ivanovich; and Minakov, Vladimir Anatolievich, 4,055,436, Cl. 106-52.000.
Sasaki, Takehiko: *See*—
Nakamura, Tutomu; Sasaki, Takehiko; Yonekawa, Masaji; and Maeda, Hidetoshi, 4,055,755, Cl. 364-705.000.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Printing head for portable labeling machine, or the like. 4,055,118, Cl. 101-110.000.
Sauerteig, Wolfgang: *See*—
Bergthaller, Peter; Himmelmann, Wolfgang; Sauerteig, Wolfgang; and Rosenhahn, Lothar, 4,055,427, Cl. 96-67.000.
Saure, Manfred: *See*—
Heumann, Heinz; Saure, Manfred; Wagner, Heinz; and Wartusch, Johann, 4,055,504, Cl. 252-63.200.
Sawanishi, Shigeru; Ozaki, Masahiko; and Katagawa, Kikuji, to Japan Exlan Company Limited. Method for opening a high-density packed column in liquid chromatography. 4,055,493, Cl. 210-31.00C.
Schafer, Jurgen, to Original Hanau Quarzlampen GmbH. Gas discharge lamp. 4,055,779, Cl. 313-220.000.
Schafer, Paul; Abel, Heinz; and Mayer, Fritz, to Ciba-Geigy Corporation. Propylene oxide reaction products, process for their manufacture and their use. 4,055,393, Cl. 8-62.000.
Schaffer, Ludwig: *See*—
Kaiser, Michael; and Schaffer, Ludwig, 4,055,289, Cl. 226-92.000.
Schank, Richard Louis: *See*—
Chu, Joseph Yung-Chang; and Schank, Richard Louis, 4,055,424, Cl. 96-35.100.

Scharf, Daniel J., to Hooker Chemicals & Plastics Corporation. Phosphonomethyl compounds. 4,055,591, Cl. 260-502.500.
Scheiding, Horst. Conveying and retaining apparatus. 4,055,139, Cl. 114-270.000.
Schenk, Wolfgang: *See*—
Doerfel, Helmut; Schmidt, Franz; Schuette, Wilhelm; Cordes, Claus; and Schenk, Wolfgang, 4,055,547, Cl. 260-67.0FP.
Schexnayder, Lawrence F., to Caterpillar Tractor Co. Control system having override for fluid operated work elements. 4,055,046, Cl. 60-428.000.
Schiemann, Heinz: *See*—
Kleen, Gerhard; Schiemann, Heinz; and Allmendinger, Karl, 4,055,825, Cl. 336-70.000.
Schimmel, Vernon R., to Symons Corporation. Inside concrete corewall form with particular three-way hinge assemblies therefor. 4,055,321, Cl. 249-182.000.
Schluenz, Robert William; and Davis, Curry Beach, to Arizona Chemical Company. Process for the preparation of terpene-maleic anhydrides containing less than 15% di-adduct. 4,055,576, Cl. 260-346.600.
Schlumberger Technology Corporation: *See*—
Antkiw, Stephen, 4,055,763, Cl. 250-270.000.
Schmanski, Donald W., to Fiberite Corporation. Woven material with filling threads at angles other than right angles. 4,055,697, Cl. 428-113.000.
Schmid, Charles F. Portable mount for radios in motor vehicles. 4,055,286, Cl. 224-42.42R.
Schmidt, Franz: *See*—
Doerfel, Helmut; Schmidt, Franz; Schuette, Wilhelm; Cordes, Claus; and Schenk, Wolfgang, 4,055,547, Cl. 260-67.0FP.
Schmidt, Gunther: *See*—
Dederra, Helmut; Schmidt, Gunther; and Stanke, Jurgen, 4,055,044, Cl. 60-265.000.
Schmidt, Terrance L.; and Thompson, Marion E., to Maytronics Group, Inc., The. Lighted greeting cards. 4,055,014, Cl. 40-152.200.
Schmidt, Walter; and Stahlin, Walter, to Prolizenz AG. Crucible. 4,055,391, Cl. 432-264.000.
Schneider, Willi A. Sheet material de-stacking machine. 4,055,258, Cl. 214-8.50C.
Schneider, Willi A. Re-stacking device for stacking partial stacks of sheet material to form a complete stack. 4,055,261, Cl. 214-6.00G.
Schoeff, John A., to Precision Monolithics, Inc. Multistage electrical ladder for decrementing a signal into a plurality of weighted signals. 4,055,773, Cl. 307-229.000.
Scholl, Inc.: *See*—
Hsiung, Du Yung, 4,055,699, Cl. 428-311.000.
Schow, Virgle L. Muffler and tail pipe expander and cleaner. 4,055,064, Cl. 72-118.000.
Schreurs, Willy P., to GTE Sylvania Incorporated. Special purpose fluorescent lamp. 4,055,781, Cl. 313-487.000.
Schroeder, Guenter: *See*—
Gruber, Wilhelm; and Schroeder, Guenter, 4,055,590, Cl. 560-179.000.
Schuette, Wilhelm: *See*—
Doerfel, Helmut; Schmidt, Franz; Schuette, Wilhelm; Cordes, Claus; and Schenk, Wolfgang, 4,055,547, Cl. 260-67.0FP.
Schultz, David C.: *See*—
Withoff, Alfred J.; and Schultz, David C., 4,055,205, Cl. 144-281.00R.
Schultz, Freddy R.: *See*—
Kronenwetter, Howard W.; and Schultz, Freddy R., 4,055,271, Cl. 220-64.000.
Schultz, William G.: *See*—
Popper, Karel; Schultz, William G.; Camirand, Wayne M.; Hautala, Earl; Robertson, George H.; Crawford, Ladell; and Finkle, Bernard J., 4,055,675, Cl. 426-470.000.
Schurger, Rainer: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,055,371, Cl. 308-201.000.
Schwinn, Joseph Michael, to Ecodyne Corporation. Non-clog water distribution nozzle. 4,055,305, Cl. 239-524.000.
SCM Corporation: *See*—
Close, Ralph E.; and Oroshnik, William, 4,055,575, Cl. 260-345.500.
Ehmann, William J., 4,055,601, Cl. 260-593.00R.
Scondo, Christian: *See*—
Kunst, Helmut; and Scondo, Christian, 4,055,446, Cl. 148-15.000.
Scragg, Robert L.; and Parker, Alfred B. Carbonaceous boiler. 4,055,165, Cl. 126-400.000.
Scriabine, Alexander, to Merck & Co., Inc. Novel anti-hypertensive compositions. 4,055,645, Cl. 424-250.000.
Seaman, Gary G.: *See*—
Keen, Ralph H.; and Seaman, Gary G., 4,055,616, Cl. 264-139.000.
Sebenda, Jan: *See*—
Bukac, Zbynek; Sebenda, Jan; and Suchy, Richard, 4,055,552, Cl. 260-78.00L.
Seese, Ray Bruce; and Watson, Bela Lee, to Union Carbide Corporation. Apparatus for improved cleaning of pipeline inlets. 4,055,025, Cl. 51-411.000.
Seipel, Winfried: *See*—
Bland, Robert J.; and Seipel, Winfried, 4,055,791, Cl. 363-28.000.
Seisuikogyo Co., Ltd.: *See*—
Hasegawa, Tsuneo; and Hasegawa, Seitaro, 4,055,490, Cl. 210-17.000.
Seitel, Norbert F.: *See*—
McDonald, Walter; Seitel, Norbert F.; and Burger, Richard A., 4,055,455, Cl. 156-351.000.
Seitz, Paul L.: *See*—
Gabel, Robert K.; and Seitz, Paul L., 4,055,495, Cl. 210-52.000.
Sell, Joseph W.: *See*—
Novak, John D.; and Sell, Joseph W., 4,055,408, Cl. 65-135.000.
Senger, Gerhard Franz-Josef, to Uniroyal Aktiengesellschaft. Pneumatic radial tire tread pattern. 4,055,209, Cl. 152-209.00R.
Sentementes, Thomas J.: *See*—
Bouchard, Andre C.; Hall, Harold H., Jr.; Mercaldi, Renaldo; and Sentementes, Thomas J., 4,055,759, Cl. 362-159.000.
Seppo, Arnold Ivanovich. Orthopaedic endoapparatus designed to grow a new live shoulder and hip joint, to reconstruct a deformed joint or to restore a pathologically dysplastic and congenitally luxated joint. 4,054,955, Cl. 3-1.910.
Servco Company, a division of Smith International, Inc., The: *See*—
Weber, Robert W., 4,055,226, Cl. 175-273.000.
Sever, James A.: *See*—
Roberts, David M.; and Sever, James A., 4,055,002, Cl. 34-104.000.
Seymour, Joseph A., to Lawrence Peska, Associates, Inc. Dispensing shower head. 4,055,278, Cl. 222-42.000.
Shannon, Edward L.: *See*—
Balaz, Alexander; Bone, David P.; and Shannon, Edward L., 4,055,681, Cl. 426-656.000.
Sharowsky, Robert: *See*—
Chu, Simon L.; Sharowsky, Robert; and Shu, Peter, 4,055,144, Cl. 118-401.000.
Sharp, James E., to Union Special Corporation. Hem folding attachment. 4,055,127, Cl. 112-143.000.
Sharp Kabushiki Kaisha: *See*—
Nakamura, Tutomu; Sasaki, Takehiko; Yonekawa, Masaji; and Maeda, Hidetoshi, 4,055,755, Cl. 364-705.000.
Sharpe, Donald M. Hikers cart. 4,055,354, Cl. 280-47.310.
Shatalov, Lev Nixolaevich: *See*—
Gusarov, Anatoly Alexandrovich; and Shatalov, Lev Nixolaevich, 4,055,683, Cl. 427-8.000.
Shaw, James L.: *See*—
Manecke, Siegfried E.; and Shaw, James L., 4,055,724, Cl. 174-66.000.
Shawl, Edward T.: *See*—
Rosenthal, Rudolph; and Shawl, Edward T., 4,055,629, Cl. 423-509.000.
Sheaff, Edward Thomas; and Hinton, Norman Alexander, to K-Vet Limited. Device for examining biological specimens. 4,055,470, Cl. 195-127.000.
Shell Oil Company: *See*—
Hunter, Leon; and Petty, Walter L., 4,055,516, Cl. 260-2.00A.
Sheppard, Chester S.; and MacLeay, Ronald E., to Pennwalt Corporation. Azo free radical initiators containing ultraviolet light stabilizing groups. 4,055,714, Cl. 526-208.000.
Sherezadashvili, Andrei Illarionovich: *See*—
Gvelesiani, Konstantin Shalvovich; Kadzhelashvili, Zauri Mikhailovich; Tskvitinidze, Alexandr Shalvovich; Tusishvili, Otari Shalvovich; Sherezadashvili, Andrei Illarionovich; Khabuliani, Gamlet Varlamovich; Bakhanova, Lia Nakhshonovna; and Tatishvili, Otari Vardenovich, 4,055,315, Cl. 243-33.000.
Sherwood Medical Industries Inc.: *See*—
Cornell, William D., 4,055,501, Cl. 210-516.000.
Shibata, Jitsu, to Mitsubishi Kaihatsu Kabushiki Kaisha. Deep-sea ore collecting and hoisting apparatus. 4,055,006, Cl. 37-69.000.
Shields, James A. Identification device for vehicles. 4,055,013, Cl. 40-129.00C.
Shill, David B.: *See*—
Crawford, G. Roger; Sanders, Duane; and Shill, David B., 4,055,203, Cl. 141-73.000.
Shimamura, Isao: *See*—
Ogawa, Junkichi; Ishii, Tsumoru; and Shimamura, Isao, 4,055,426, Cl. 96-66.400.
Shimizu, Mikio: *See*—
Honkawa, Tadashi; Fukuda, Kenji; and Shimizu, Mikio, 4,055,395, Cl. 23-253.00R.
Shimizu, Ryuichi: *See*—
Kawai, Shichio; Tanaka, Takaho; Bannai, Eisuke; Uchida, Kenji; and Shimizu, Ryuichi, 4,055,780, Cl. 313-346.00R.
Shimomura, Jun, to Nippon Kogaku K.K. Light receiving device for photoelectric conversion element. 4,055,761, Cl. 250-239.000.
Shiozaki, Hiroko, legal representative: *See*—
Inukai, Noriyoshi; Murakami, Masuo; Iwamoto, Hidenori; Yanagisawa, Isao; Tamura, Toshinari; Ishii, Yoshio; Tomioka, Kenichi; and Shiozaki, Tetsuya, deceased, 4,055,589, Cl. 560-121.000.
Shiozaki, Tetsuya, deceased: *See*—
Inukai, Noriyoshi; Murakami, Masuo; Iwamoto, Hidenori; Yanagisawa, Isao; Tamura, Toshinari; Ishii, Yoshio; Tomioka, Kenichi; and Shiozaki, Tetsuya, deceased, 4,055,589, Cl. 560-121.000.
Shirahata, Kunikatsu: *See*—
Tomioka, Shinji; Mori, Yasuki; Nara, Takashi; and Shirahata, Kunikatsu, 4,055,715, Cl. 536-17.000.
Shirai, Takashi: *See*—
Ishida, Torao; Shirai, Takashi; and Akiyama, Minoru, 4,055,716, Cl. 536-23.000.
Shishkarev, Eduard Evgenievich: *See*—
Ulyanov, Viktor Leonidovich; Shishkarev, Eduard Evgenievich; Nazarenko, Valentin Vasilievich; Yavich, Vladimir Efimovich, deceased; and Yavich, Maria Semenovna, administrator, 4,055,216, Cl. 164-258.000.

Shoemaker, Ralph W.: *See—*
Wilson, Wallace C.; and Shoemaker, Ralph W., 4,055,830, Cl. 340-16.00R.
Shringarpurey, Sudhir K.: *See—*
Maurer, Gerald L.; and Shringarpurey, Sudhir K., 4,055,655, Cl. 424-294.000.
Shriver, Edward L., to United States of America, National Aeronautics and Space Administration. Semiconductor projectile impact detector. 4,055,089, Cl. 73-432.00R.
Shu, Peter: *See—*
Chu, Simon L.; Sharowsky, Robert; and Shu, Peter, 4,055,144, Cl. 118-401.000.
Shuster, Edward J.: *See—*
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,055,506, Cl. 252-132.000.
Sibrava, Joseph, to Perkin-Elmer Corporation, The. Sample transport with rotary air interlock charging and discharging means. 4,055,259, Cl. 214-17.00A.
Siebert, Werner: *See—*
Beck, Kurt-Gunther; Rohde, Wolfgang; Habermehl, Diethard; and Siebert, Werner, 4,055,471, Cl. 201-20.000.
Siemens Aktiengesellschaft: *See—*
Bussmann, Egon; Flamme, Bruno; Vanhumbeeck, Jacky; Helder, Johannes; and De Steur, Hubert, 4,055,751, Cl. 364-500.000.
Fiedler, Helmut, 4,055,775, Cl. 307-254.000.
Kleen, Gerhard; Schiemann, Heinz; and Allmendinger, Karl, 4,055,825, Cl. 336-70.000.
Stein, Karl-Ulrich; and Horninger, Karlheinrich, 4,055,837, Cl. 340-173.00R.
Sigma Lutin, narodni podnik: *See—*
Langr, Oldrich, 4,055,073, Cl. 72-467.000.
Simich, Emil; and Traxinger, Walter R., to A. J. Gerrard & Company. Bale-tie interlock device. 4,055,115, Cl. 100-34.000.
Simich, Emil, to A. J. Gerrard & Company. Bale-tie joiner tool. 4,055,328, Cl. 254-79.000.
Simonet, Guy: *See—*
Faugeras, Pierre; Lecoq, Pierre; Miquel, Pierre; Rouyer, Hubert; and Simonet, Guy, 4,055,625, Cl. 423-262.000.
Simpson, Hugh Walter; and Green, Douglas. Apparatus for making surface temperature measurements on the human body. 4,055,166, Cl. 128-2.00H.
Simpson, William R.; and Strohschein, Robert J., to Sandoz, Inc. 4-Alkyl-2,6-di-(secondary or tertiary alkyl)amino-3-formylpyridines pharmaceutical compositions thereof and their use in the treatment of obesity and diabetes. 4,055,649, Cl. 424-263.000.
Singer Company, The: *See—*
Hunts, Barney D.; Hare, George H.; and Eaton, Bradley, 4,055,129, Cl. 112-158.00E.
Larsen, Robert H.; and Minalga, Philip F., 4,055,130, Cl. 112-158.00R.
O'Brien, James Eugene; and Ostapczuk, Edward Walter, 4,055,131, Cl. 112-158.00E.
Siri, Joseph J.; and Knapp, John P., to Siri Systems, Inc. Wood cleaning and separating apparatus. 4,055,488, Cl. 209-173.000.
Siri Systems, Inc.: *See—*
Siri, Joseph J.; and Knapp, John P., 4,055,488, Cl. 209-173.000.
Sivilotti, Olivo Giuseppe, to Alcan Research and Development Limited. Procedures and apparatus for electrolytic production of metals. 4,055,474, Cl. 204-70.000.
Sjostrand, Uno Roland; and Johansson, Goran Karl Nils, to AB Zinistor. Method and an arrangement for the purification of air in packing machines. 4,055,035, Cl. 53-167.000.
Skeggs, Leonard T., to Locust Farms, Inc. Foaling alarm. 4,055,839, Cl. 340-279.000.
SKF Industrial Trading and Development Company, B.V.: *See—*
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,055,371, Cl. 308-201.000.
Ziekman, Paul; and van Riet, Jan A. P., 4,055,382, Cl. 356-210.000.
Skibbe, Martin O., to Armour Pharmaceutical Company. Pharmaceutical preparations containing 4-(4-biphenylyl) butylamines and treatment of the animal organism therewith. 4,055,664, Cl. 424-330.000.
SKM: *See—*
Binoche, Michel, 4,055,300, Cl. 239-15.000.
Skvortsov, Gennady Fedorovich: *See—*
Lukyanov, Jury Sergeevich; Kazantsev, Lev Seliverstovich; Pomeschikov, Andrei Grigorievich; and Skvortsov, Gennady Fedorovich, 4,055,722, Cl. 13-16.000.
Sleumer, Hendrikus Bernardus: *See—*
Kats, Mindert; and Sleumer, Hendrikus Bernardus, 4,055,114, Cl. 99-280.000.
Sloan-Kettering Institute for Cancer Research: *See—*
Goldstein, Gideon, 4,055,633, Cl. 424-1.000.
Slonaker, Robert O.; and Emerson, Jack L., to Owens-Corning Fiberglas Corporation. Apparatus for making glass fibers material. 4,055,406, Cl. 65-11.00W.
Smiglee, Jerome: *See—*
Thornton, Douglas R.; and Smiglee, Jerome, 4,055,835, Cl. 340-147.0LP.
Smith, Archibald W., to International Business Machines. Q-switching injection laser with oxygen implanted region. 4,055,815, Cl. 331-94.50H.
Smith, Clay D.; and Keller, Douglas V., Jr., to Standard Oil Company. Multi-phase separation methods and apparatus. 4,055,480, Cl. 208-11.0LE.
Smith, Gerald W.: *See—*
Costello, Frederick A.; Manniso, James L.; DiPinto, Anthony J.; and Smith, Gerald W., 4,055,163, Cl. 126-271.000.
Smith, James Walker: *See—*
Metzger, Shirley Jean; Smith, James Walker; and Leal, Juan Castillo, 4,054,970, Cl. 17-71.000.
Smith, Larry D.: *See—*
Tillman, Lynn W.; Henscheid, Kent R.; and Smith, Larry D., 4,055,757, Cl. 364-715.000.
Smith, Richard E.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,055,340, Cl. 271-236.000.
SmithKline Corporation: *See—*
Mendelson, Wilford Lee, 4,055,573, Cl. 548-335.000.
Smits, Friedolf Michael: *See—*
Panousis, Peter Theodore; Pritchett, Robert Leonard; and Smits, Friedolf Michael, 4,055,802, Cl. 324-73.0AT.
Smrcka, Joseph G.: *See—*
Goodenough, David John; Weaver, Kenneth E.; Smrcka, Joseph G.; and Clayman, William, 4,055,771, Cl. 250-505.000.
Smrt, Thomas J., to Fox Valley Marking Systems, Inc. Automatic feeding apparatus. 4,055,146, Cl. 119-51.110.
Snam Progetti S.p.A.: *See—*
Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, 4,055,535, Cl. 260-45.70R.
Snoke, Roy Eugene; and Klein, Gerald Wayne, to Eastman Kodak Company. Purification of microbial enzyme extracts using synthetic polyelectrolytes. 4,055,469, Cl. 195-66.00R.
Societa' Italina Resine S.I.R. S.p.A.: *See—*
Cocuzza, Gioacchino; Montoro, Italo; and Calcagno, Benedetto, 4,055,579, Cl. 260-348.340.
Societe Anonyme de Telecommunications: *See—*
Jolivet, Jean-Claude; and Stouls, Francois-Xavier Antoine, 4,055,756, Cl. 364-725.000.
Societe Anonyme Roure Bertrand Dupont: *See—*
Teisseire, Paul Jose, 4,055,594, Cl. 260-514.00G.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Badertscher, Ernest; Chaveron, Michel; and Wenner, Valentin, 4,055,555, Cl. 260-119.000.
Sogge, John W., to Caterpillar Tractor Co. Biasing element having one or more force stages. 4,055,368, Cl. 305-57.000.
Soley, Warren G., to Magnetics International, Inc. Magnetic separator for solid waste. 4,055,489, Cl. 209-223.00R.
Solie, Leland P., to Sperry Rand Corporation. Reflective dot array for acoustic wave processing. 4,055,820, Cl. 333-30.00R.
Solomon, David E., to KMS Fusion, Inc. Container for hydrogen isotopes. 4,055,276, Cl. 222-3.000.
Soma, Nobuo; Yoshioka, Takao; Kurumada, Tomoyuki; and Morimura, Syoji, to Sankyo Company Limited. 4,4'-Bipiperidylidene derivatives and their use as stabilizers. 4,055,536, Cl. 260-45.80N.
Sommer, Richard: *See—*
Wiesel, Manfred; and Sommer, Richard, 4,055,557, Cl. 260-162.000.
Sony Corporation: *See—*
Tanaka, Shigeo, 4,055,784, Cl. 315-397.000.
Tozawa, Keizaburo; Amatsu, Hideo; Takahashi, Shinichiro; Fujimoto, Kazumi; and Ikeda, Kishio, 4,055,372, Cl. 312-15.000.
Sorocin, Viera. Collapsible carry-all cart. 4,055,357, Cl. 280-641.000.
Soucie, Claude. Rotating maze game device. 4,055,344, Cl. 273-110.000.
Sperling, Phillip. Fabric hanging and pleating bracket with stabilizing elements. 4,055,211, Cl. 160-327.000.
Sperry Rand Corporation: *See—*
Solie, Leland P., 4,055,820, Cl. 333-30.00R.
Wesner, Charles R., 4,055,135, Cl. 114-144.00E.
Spiegel, Francis X.: *See—*
Hirsch, Arthur; Spiegel, Francis X.; and Ramsbottom, John M., 4,055,672, Cl. 426-127.000.
Spinner, Joseph R.: *See—*
Kohl, Vance L.; and Spinner, Joseph R., 4,055,280, Cl. 222-70.000.
Square S.A.: *See—*
Roma, Carlo, 4,054,980, Cl. 29-157.30R.
Stahl, Richard F.: *See—*
Murphy, Kevin P.; and Stahl, Richard F., 4,055,049, Cl. 60-651.000.
Murphy, Kevin P.; Stahl, Richard F.; and Orfeo, Sabatino R., 4,055,054, Cl. 62-114.000.
Stahlin, Walter: *See—*
Schmidt, Walter; and Stahlin, Walter, 4,055,391, Cl. 432-264.000.
Stal-Laval Turbin AB: *See—*
Norberg, Lars; and Olsson, Erik, 4,055,299, Cl. 237-2.00B.
Stambaugh, Edgel P.; and Sachsel, George F., to Battelle Memorial Institute. Extracting sulfur and ash. 4,055,400, Cl. 44-1.00R.
Stamberg, Jiri: *See—*
Peska, Jan; Stamberg, Jiri; and Blace, Zdenko, 4,055,510, Cl. 252-426.000.
Standard Oil Company: *See—*
Smith, Clay D.; and Keller, Douglas V., Jr., 4,055,480, Cl. 208-11.0LE.
Standard Oil Company (Indiana): *See—*
Parrish, David R., 4,055,399, Cl. 23-230.0EP.
Poppe, Wassily; and Fielding, Ivor R., 4,055,530, Cl. 260-29.6RW.
Poppe, Wassily W.; and Inskeep, Mark D., 4,055,608, Cl. 260-857.00L.
Standard Packaging Corporation: *See—*
Hirsch, Arthur; Spiegel, Francis X.; and Ramsbottom, John M., 4,055,672, Cl. 426-127.000.
Standard-Thomson Corporation: *See—*
Wilson, Earl L., 4,055,298, Cl. 236-34.500.

Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., to Xerox Corporation. Assisted pneumatic transport and registration apparatus. 4,055,340, Cl. 271-236.000.

Stanke, Jurgen: *See*—
Dederra, Helmut; Schmidt, Gunther; and Stanke, Jurgen, 4,055,044, Cl. 60-265.000.

Stapleford, Gary N.; and Sandahl, Joel E., to Comex Systems, Inc. Circuit for detecting dial pulses. 4,055,730, Cl. 179-84.0VF.

Statz, Wilbert A. Small game holder. 4,054,968, Cl. 17-44.200.

Stecura, Stephan; and Leibert, Curt H., to United States of America, National Aeronautics and Space Administration. Thermal barrier coating system. 4,055,705, Cl. 428-633.000.

Stefan, Mihaly; Nagy, Tibor; and Daroczi, Sandor, to Csepeli Femmu. Process for the removal of alloying impurities in a slag-covered copper refining bath. 4,055,415, Cl. 75-74.000.

Stein, Karl-Ulrich; and Horninger, Karlheinrich, to Siemens Aktiengesellschaft. Dynamic single-transistor memory element for relatively permanent memories. 4,055,837, Cl. 340-173.00R.

Stein, Werner: *See*—
Rupilius, Wolfgang; and Stein, Werner, 4,055,492, Cl. 210-21.000.

Steinberg, Robert; Alger, Donald L.; and Cooper, Dale W., to United States of America, National Aeronautics and Space Administration. Method of forming metal hydride films. 4,055,686, Cl. 427-124.000.

Steinberg, Sidney: *See*—
Auerbach, Albert A.; Katz, George M.; and Steinberg, Sidney, 4,055,189, Cl. 128-419.0PG.

Stelwagen, Willem, to Akzona Incorporated. Transfer of heat between two bodies. 4,055,220, Cl. 165-89.000.

Stendel, Wilhelm: *See*—
Hoffmann, Hellmut; Hammann, Ingeborg; and Stendel, Wilhelm, 4,055,571, Cl. 260-308.00R.

Stephens, Wilbur E., to Alumax Inc. Recycle burner system. 4,055,334, Cl. 266-138.000.

Sterck, Lothar: *See*—
Saffran, Helmut; and Sterck, Lothar, 4,055,577, Cl. 260-346.700.

Sterling Drug Inc.: *See*—
Carabateas, Philip M.; and Williams, Gordon L., 4,055,588, Cl. 560-23.000.
Christiansen, Robert George, 4,055,562, Cl. 260-239.55R.

Stern, Ernest; Williamson, Richard C.; Bers, Abraham; and Cafarella, John H., to Massachusetts Institute of Technology. Surface wave devices for processing signals. 4,055,758, Cl. 364-821.000.

Sterndent Corporation: *See*—
French, Park, 4,055,813, Cl. 330-103.000.

Stewart, Robert E.: *See*—
Jenkins, Stephen R.; Northrup, Thomas A.; and Stewart, Robert E., 4,055,851, Cl. 364-200.000.

Stohrer, Charles E., Jr.; Huff, Norman M.; and Micinski, Leonard J., to Harper-Wyman Company. Method of forming ports in a fuel burner. 4,055,132, Cl. 113-116.0EE.

Stoilov, Nicolay Stefanov: *See*—
Ronnquist, Axel Georg; Lindahl, Erik Tommie; and Stoilov, Nicolay Stefanov, 4,055,700, Cl. 428-366.000.

Stotler, Charles L., Jr.: *See*—
Adamson, Arthur P.; Sargisson, Donald F.; and Stotler, Charles L., Jr., 4,055,041, Cl. 60-226.00R.

Stoub, James W.: *See*—
Sandberg, Glenn A.; Richards, Louis R.; and Stoub, James W., 4,054,967, Cl. 17-32.000.

Stouls, Francois-Xavier Antoine: *See*—
Jolivet, Jean-Claude; and Stouls, Francois-Xavier Antoine, 4,055,756, Cl. 364-725.000.

Stramaglia, Melchiore M., to Container Corporation of America. Tray with reinforced walls. 4,055,293, Cl. 229-31.0FS.

Strauss, Richard, to Whatman Reeve Angel Limited. Compressed air dryer. 4,055,403, Cl. 55-31.000.

Strekalov, Anatoly Vasilievich: *See*—
Pavlushkin, Nikolai Mikheevich; Bondarev, Konstantin Timofeevich; Strekalov, Anatoly Vasilievich; Kozlovsky, Viktor Stepanovich; Minakov, Anatoly Gavrilovich; Golius, Tamara Efimovna; Orlova, Ljudmila Alexeevna; Sarkisov, Pavel Dzhibraelovich; Kozmin, Mikhail Ivanovich; and Minakov, Vladimir Anatolievich, 4,055,436, Cl. 106-52.000.

Strohschein, Robert J.: *See*—
Simpson, William R.; and Strohschein, Robert J., 4,055,649, Cl. 424-263.000.

Strutz, Hans-Jurgen: *See*—
Bock, Jurgen; and Strutz, Hans-Jurgen, 4,055,311, Cl. 242-18.0DD.

Stuart, Edwin G. Surface projectile game apparatus. 4,055,343, Cl. 273-108.000.

Stubbings, James Henry, to Potomac Applied Mechanics, Inc. Band and saber saw arrangement. 4,055,102, Cl. 83-749.000.

Suchy, Richard: *See*—
Bukac, Zbynek; Sebenda, Jan; and Suchy, Richard, 4,055,552, Cl. 260-78.00L.

Suevia Haiges KG, Firma: *See*—
Haiges, Adolf, 4,055,149, Cl. 119-147.00A.

Sugahara, Hirozo: *See*—
Kawata, Noboru; Honna, Kosaku; and Sugahara, Hirozo, 4,055,721, Cl. 560-207.000.

Sugino, Satoru: *See*—
Kakitani, Haruaki; and Sugino, Satoru, 4,055,518, Cl. 260-2.5AM.

Sujansky, Vladimir, to ICI Australia Limited. Explosive composition containing amine solvating agent. 4,055,450, Cl. 149-60.000.

Sukman, Edwin L.: *See*—
Guthrie, Roger T.; Hirshman, Justin L.; Littman, Stanley; Sukman, Edwin L.; and Ravenscroft, Philip H., 4,055,702, Cl. 428-398.000.

Sullivan, Daryl Dean: *See*—
Zeller, Robert Dale; and Sullivan, Daryl Dean, 4,055,383, Cl. 356-229.000.

Sullivan, Thomas R.; Christenson, Roger M.; Das, Suryya K.; and Dowbenko, Rostyslaw, to PPG Industries, Inc. Acrylic coating compositions. 4,055,607, Cl. 260-851.000.

Sumitomo Chemical Company, Limited: *See*—
Hotta, Seiji; and Akamatsu, Takashi, 4,055,565, Cl. 260-281.00N.
Okamoto, Masahiro; Nemoto, Makoto; Kataoka, Yushin; and Tokugawa, Yoshiharu, 4,055,585, Cl. 260-453.0SP.

Sundberg, Leif, to Wamac AB. Device with collecting basket for collecting printed matter in a pile and discharging the same. 4,055,245, Cl. 198-422.000.

Sunmark, Inc.: *See*—
Kelly, Ray G.; Pruitt, Kenneth R., Sr.; and Kershman, Alvin L., 4,055,669, Cl. 426-93.000.

Suntech, Inc.: *See*—
Norton, Richard V., 4,055,587, Cl. 260-465.00C.

Sushkov, Valery Petrovich: *See*—
Akimov, Jury Stepanovich; Sushkov, Valery Petrovich; and Kurinny, Vladimir Ivanovich, 4,055,443, Cl. 148-1.500.

Swallow, Roger T., to Kendall Company, The. Belt assembly. 4,054,952, Cl. 2-338.000.

Swanson, Billy L., to Phillips Petroleum Company. Method and composition for acidizing subterranean formations. 4,055,502, Cl. 252-8.55C.

Sweeney, Patrick E., to AAI Corporation. Cutting torch arrangement. 4,055,332, Cl. 266-48.000.

Sweetser, Philip B.: *See*—
Johnson, Alexander L.; and Sweetser, Philip B., 4,055,409, Cl. 71-76.000.

Swinehart, Carl F., to Harshaw Chemical Company, The. Method for growing absorption-free alkali metal halide single crystals. 4,055,457, Cl. 156-616.00R.

Symons Corporation: *See*—
Schimmel, Vernon R., 4,055,321, Cl. 249-182.000.

Syntex (U.S.A.) Inc.: *See*—
Ackrell, Jack; and Muchowski, Joseph M., 4,055,574, Cl. 260-327.00B.
Alvarez, Francisco S.; and Van Horn, Albert R., 4,055,564, Cl. 542-413.000.
Walker, Keith A. M., 4,055,652, Cl. 424-273.00R.

Taga, Yasuyoshi; and Wakasone, Masaharu, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing granular potassium sorbate. 4,055,617, Cl. 264-141.000.

Taguchi, Yoshinobu: *See*—
Masuzima, Sho; Takahashi, Tetsuo; Taguchi, Yoshinobu; and Fujita, Hisashi, 4,054,988, Cl. 29-564.600.

Tajima, Eiichi; Yamamoto, Kaname; and Imai, Takayoshi, to Tajima Roofing Co., Ltd. Process for producing laminated bituminous roofing membrane. 4,055,453, Cl. 156-279.000.

Tajima Roofing Co., Ltd.: *See*—
Tajima, Eiichi; Yamamoto, Kaname; and Imai, Takayoshi, 4,055,453, Cl. 156-279.000.

Takahashi, Mitsuo: *See*—
Okudaira, Shigenori; Takahashi, Mitsuo; Irie, Takefumi; Itoh, Eiji; and Kashiwagi, Koh, 4,055,621, Cl. 423-79.000.
Takeuchi, Takeshi; and Takahashi, Mitsuo, 4,055,809, Cl. 325-308.000.

Takahashi, Shinichiro: *See*—
Tozawa, Keizaburo; Amatsu, Hideo; Takahashi, Shinichiro; Fujimoto, Kazumi; and Ikeda, Kishio, 4,055,372, Cl. 312-15.000.

Takahashi, Tetsuo: *See*—
Masuzima, Sho; Takahashi, Tetsuo; Taguchi, Yoshinobu; and Fujita, Hisashi, 4,054,988, Cl. 29-564.600.

Takamatsu, Akira: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Takamatsu, Akira; Inui, Taiji; Tone, Hiroshi; and Morishima, Hajime, 4,055,468, Cl. 195-29.000.

Takeda, Hideichi: *See*—
Okawa, Taro; and Takeda, Hideichi, 4,055,031, Cl. 52-172.000.

Takeuchi, Takeshi; and Takahashi, Mitsuo, to Hochiki Corporation. Amplifying device. 4,055,809, Cl. 325-308.000.

Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Takamatsu, Akira; Inui, Taiji; Tone, Hiroshi; and Morishima, Hajime, 4,055,468, Cl. 195-29.000.

Takeuchi, Toru: *See*—
Kiyokawa, Shin; Sakaguchi, Shokichi; and Takeuchi, Toru, 4,055,526, Cl. 264-22.000.

Tall, Albert: *See*—
Thimons, Edward D.; Vinson, Robert P.; Kissell, Fred N.; and Tall, Albert, 4,055,074, Cl. 73-40.000.

Tamao, Yoshikuni: *See*—
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,055,636, Cl. 424-177.000.
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,055,651, Cl. 424-267.000.

Tamas, Attila J., to Clark Equipment Company. Battery extractor for vehicles. 4,055,260, Cl. 214-44.00R.

Tamura, Toshinari: *See—*
Inukai, Noriyoshi; Murakami, Masuo; Iwamoto, Hidenori; Yanagisawa, Isao; Tamura, Toshinari; Ishii, Yoshio; Tomioka, Kenichi; and Shiozaki, Tetsuya, deceased, 4,055,589, Cl. 560-121.000.

Tanaka, Hiroshi; Ogisu, Noriyuki; and Urakawa, Akira, to Nichibei Fuji Cycle Co., Ltd. Bicycle brake device with increased braking power. 4,055,235, Cl. 188-24.000.

Tanaka, Shigeo, to Sony Corporation. Electron beam deflection circuit. 4,055,784, Cl. 315-397.000.

Tanaka, Takaho: *See—*
Kawai, Shichio; Tanaka, Takaho; Bannai, Eisuke; Uchida, Kenji; and Shimizu, Ryuichi, 4,055,780, Cl. 313-346.00R.

Tangen, Walter, to Gewako S.A. Stabilizing device for an inflatable raft. 4,054,961, Cl. 9-11.00A.

Tannetics, Inc.: *See—*
Iannelli, Frank M., 4,055,198, Cl. 137-116.500.

Tany, Michio. Electrical therapeutic apparatus. 4,055,190, Cl. 128-422.000.

Tasman Joinery Company Limited: *See—*
Duckett, Herbert John, 4,055,318, Cl. 248-243.000.

Tassoney, Joseph P.: *See—*
Choi, Charles K.; and Tassoney, Joseph P., 4,055,486, Cl. 209-11.000.

Tatishvili, Otari Vardenovich: *See—*
Gvelesiani, Konstantin Shalvovich; Kadzhelashvili, Zauri Mikhailovich; Tskvitinidze, Alexandr Shalvovich; Tusishvili, Otari Shalvovich; Sherezadashvili, Andrei Illarionovich; Khabuliani, Gamlet Varlamovich; Bakhanova, Lia Nakhshonovna; and Tatishvili, Otari Vardenovich, 4,055,315, Cl. 243-33.000.

Taub, Bernard; and Ostrozynski, Robert Leopold, to Allied Chemical Corporation. Constant boiling ternary compositions and the process for using such compositions in the preparation of polyurethane foam. 4,055,521, Cl. 260-2.5AF.

Taylor, Clarence R. Electric shaver head cleaning device. 4,054,963, Cl. 15-310.000.

Taylor & Gaskin: *See—*
Zalewski, Norman G., 4,055,246, Cl. 198-575.000.

Taylor, Lynn Johnston; and Troy, Henry Neal, to Owens-Illinois, Inc. Process for recovering, recycling and reusing a composite container. 4,055,441, Cl. 134-10.000.

Tech, Kurt O.: *See—*
Chynoweth, Lawrence L.; and Tech, Kurt O., 4,055,386, Cl. 408-13.000.

Teisseire, Paul Jose, to Societe Anonyme Roure Bertrand Dupont. Intermediates useful for the production of norpatchoulenol. 4,055,594, Cl. 260-514.00G.

Tekma Kinomat S.p.A.: *See—*
Bonaiti, Francesco, 4,055,310, Cl. 242-7.080.

Tennison, Stephen Robert: *See—*
McCarroll, John James; Clark, John Trevor Kent; and Tennison, Stephen Robert, 4,055,628, Cl. 423-448.000.

Tewsley, Eric William; and Matthewman, Ian, to Wildt Mellor Bromley Limited. Electronic control data transmission for knitting machines. 4,055,058, Cl. 66-50.00R.

Texas Instruments Incorporated: *See—*
Rao, G. R. Mohan, 4,055,444, Cl. 148-1.500.
Wagers, Robert S.; and Hartmann, Clinton S., 4,055,819, Cl. 333-30.00R.
Wagers, Robert S.; and Hartmann, Clinton S., 4,055,821, Cl. 333-70.00T.

Textron Inc.: *See—*
Moertel, George B.; and Johnston, James R., 4,054,973, Cl. 24-205.00R.

Tezuka, Tohru: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,055,636, Cl. 424-177.000.
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,055,651, Cl. 424-267.000.

Thermoguard Insulation Co.: *See—*
Crawford, G. Roger; Sanders, Duane; and Shill, David B., 4,055,203, Cl. 141-73.000.

Thimons, Edward D.; Vinson, Robert P.; Kissell, Fred N.; and Tall, Albert, to United States of America, Interior. Window method for measuring leakage. 4,055,074, Cl. 73-40.000.

Thomas, G. Lamar: *See—*
Pike, Harold L.; Thomas, G. Lamar; Ketchum, Ronald L.; and Evans, John F., 4,055,801, Cl. 324-73.00R.

Thompson, Darrell R., to Celanese Corporation. Stabilized acetonitrile solvent containing polyacrylonitrile compositions and method of forming same. 4,055,532, Cl. 260-32.400.

Thompson, Harold. Mini bench rest. 4,055,017, Cl. 42-94.000.

Thompson, Henry Clark, to Thompson, Henry Clark. Simultaneously foamed resin and magnesium oxychloride cement. 4,055,519, Cl. 260-2.5AK.

Thompson, Hugh C.: *See—*
Osofsky, Irving B.; and Thompson, Hugh C., 4,055,104, Cl. 89-1.00A.

Thompson, Marion E.: *See—*
Schmidt, Terrance L.; and Thompson, Marion E., 4,055,014, Cl. 40-152.200.

Thomson-CSF: *See—*
Huignard, Jean Pierre; and Micheron, Francois, 4,055,838, Cl. 340-173.200.
Lyon-Caen, Robert; and Ngu Tung, Pham, 4,055,728, Cl. 179-15.0AT.

Thornton, Douglas R.; and Smiglee, Jerome, to Manitou Systems, Inc. Line-seizing apparatus. 4,055,835, Cl. 340-147.0LP.

Thorp, Jeffrey Meyrick: *See—*
Haydock, David Bryan; Mulholland, Thomas Patrick Cunningham; and Thorp, Jeffrey Meyrick, 4,055,595, Cl. 260-520.00B.

Three Bond Co., Ltd.: *See—*
Saito, Tsutomu, 4,055,542, Cl. 260-47.0UA.

Thummel, Rudolph C.: *See—*
Dawes, Dag; and Thummel, Rudolph C., 4,055,572, Cl. 260-308.00R.

Thun-Hohenstein, Carl, to Reflex Mobelpflegemittel-Erzeugung Konrad Schischlik & Sohne. Accessory for use with vacuum cleaners or vacuum-cleaning conduits. 4,055,405, Cl. 55-216.000.

Tile Council of America, Inc.: *See—*
Burley, David R., 4,055,529, Cl. 260-29.6RW.

Tillman, Lynn W.; Henscheid, Kent R.; and Smith, Larry D., to Hewlett-Packard Company. Calculator apparatus with annuity switch for performing begin-and end-period annuity calculations. 4,055,757, Cl. 364-715.000.

Timken Company, The: *See—*
Harbottle, William E., 4,054,999, Cl. 33-181.0AT.

Timpa, Judy D.: *See—*
Chance, Leon H.; and Timpa, Judy D., 4,055,720, Cl. 544-205.000.

Tobey, James F.: *See—*
Jeffreys, George A.; Price, Jean L.; and Tobey, James F., 4,055,666, Cl. 426-31.000.

Tokico Ltd.: *See—*
Haraikawa, Tetsuo; and Ito, Hiroshi, 4,055,238, Cl. 188-73.500.

Tokugawa, Yoshiharu: *See—*
Okamoto, Masahiro; Nemoto, Makoto; Kataoka, Yushin; and Tokugawa, Yoshiharu, 4,055,585, Cl. 260-453.0SP.

Tokui, Masaaki: *See—*
Komiyama, Yoshiro; Uchida, Kunihiko; and Tokui, Masaaki, 4,055,417, Cl. 75-142.000.

Tokyo Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
Masuzima, Sho; Takahashi, Tetsuo; Taguchi, Yoshinobu; and Fujita, Hisashi, 4,054,988, Cl. 29-564.600.

Tokyo Gihatsu Seikei Company Limited: *See—*
Nakayama, Taisuke; and Nakajima, Sokichi, 4,054,954, Cl. 3-1.000.

Tomioka, Kenichi: *See—*
Inukai, Noriyoshi; Murakami, Masuo; Iwamoto, Hidenori; Yanagisawa, Isao; Tamura, Toshinari; Ishii, Yoshio; Tomioka, Kenichi; and Shiozaki, Tetsuya, deceased, 4,055,589, Cl. 560-121.000.

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Tonomura, Shinji: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,055,636, Cl. 424-177.000.
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Torney, Helen T.: *See—*
Torney, Harry L.; Torney, Helen T.; and Bordt, Dale E., 4,055,466, Cl. 195-1.700.

Torres, Jose Marcelo, to Combustion Engineering, Inc. Automatic motion inhibit system for a nuclear power generating system. 4,055,463, Cl. 176-24.00R.

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Nagamura, Masatatsu; Kominami, Hideyuki; Amagami, Keizo; Kobayashi, Takao; and Toyooka, Tadao, 4,055,740, Cl. 219-10.49R.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Futamura, Kazumasa, 4,055,045, Cl. 60-322.000.
Komiyama, Yoshiro; Uchida, Kunihiko; and Tokui, Masaaki, 4,055,417, Cl. 75-142.000.
Konishi, Masami; and Futamura, Kazumasa, 4,055,043, Cl. 60-282.000.
Kono, Toshiyuki, 4,055,153, Cl. 123-8.090.
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Numazawa, Akio; Nakamura, Hiroyuki; Kurita, Tokio; Horie, Kouji; and Kondo, Toshio, 4,055,237, Cl. 188-73.400.

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Traise, John E. Combined mailer and return envelope assembly. 4,055,294, Cl. 229-69.000.

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Simich, Emil; and Traxinger, Walter R., 4,055,115, Cl. 100-34.000.

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Jasperson, Robert E.; Erb, Charles G.; Haber, Donald F.; and Pouring, Andrew A., 4,055,121, Cl. 102-14.000.

Tripp, Dwight E. Centrifugal clutch mechanism. 4,055,241, Cl. 192-105.0CE.

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Troy, Henry Neal: *See—*
Taylor, Lynn Johnston; and Troy, Henry Neal, 4,055,441, Cl. 134-10.000.

Tsai, Shan-Pu: *See—*
Benezra, Leo L.; Hill, David W.; Riihimaki, Arnold; and Tsai, Shan-Pu, 4,055,476, Cl. 204-98.000.

Tskvitinidze, Alexandr Shalvovich: *See—*
Gvelesiani, Konstantin Shalvovich; Kadzhelashvili, Zauri Mikhailovich; Tskvitinidze, Alexandr Shalvovich; Tusishvili, Otari Shalvovich; Sherezadashvili, Andrei Illarionovich; Khabuliani, Gamlet Varlamovich; Bakhanova, Lia Nakhshonovna; and Tatishvili, Otari Vardenovich, 4,055,315, Cl. 243-33.000.

Tulip, Robert: *See—*
Langley, Philip Edward; and Tulip, Robert, 4,055,600, Cl. 260-586.00P.

Tumble Not Tumbler, Inc.: *See—*
Jones, Dennis J., 4,055,273, Cl. 220-70.000.

Turner, John A.; and Ritchie, Gordon J. Electrical position resolving by zero-crossing delay. 4,055,726, Cl. 178-18.000.

Turunen, Risto, to Valmet Oy. Paper machine with single-wire and curved twin-wire formers. 4,055,461, Cl. 162-290.000.

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Tweet, David E.: *See—*
Panandiker, K. A. Pai; and Tweet, David E., 4,055,550, Cl. 260-77.5AA.
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Uchida, Kenji: *See—*
Kawai, Shichio; Tanaka, Takaho; Bannai, Eisuke; Uchida, Kenji; and Shimizu, Ryuichi, 4,055,780, Cl. 313-346.00R.

Uchida, Kunihiko: *See—*
Komiyama, Yoshiro; Uchida, Kunihiko; and Tokui, Masaaki, 4,055,417, Cl. 75-142.000.

Uchytil, Anton R.; and Gorder, Ray L. Reusable safety warning device. 4,055,840, Cl. 340-321.000.

Ultra-Centrifuge Nederland N.V.: *See—*
van Heel, Hubertus Johannes Gerardus, 4,055,397, Cl. 23-264.000.

Ulyanov, Viktor Leonidovich; Shishkarev, Eduard Evgenievich; Nazarenko, Valentin Vasilievich; Yavich, Vladimir Efimovich, deceased; and by Yavich, Maria Semenovna, administrator. Vacuum casting machine. 4,055,216, Cl. 164-258.000.

Umezawa, Hamao; Takeuchi, Tomio; Aoyagi, Takaaki; Takamatsu, Akira; Inui, Taiji; Tone, Hiroshi; and Morishima, Hajime, to Sanraku-Ocean Co., Ltd. Processes for producing physiologically active peptide and its N-acyl derivatives. 4,055,468, Cl. 195-29.000.

Underwood, J. Larry. Multiple chamber package. 4,055,270, Cl. 220-23.000.

Union Camp Corporation: *See—*
Cheng, Thomas T., 4,055,525, Cl. 260-18.00N.

Union Carbide Corporation: *See—*
Barthel, Alfred, 4,055,268, Cl. 220-9.00C.
Brown, Harry J.; Forgeng, William D.; and Brown, Charles M., 4,055,742, Cl. 219-145.000.
Marsden, James Glenn; and Orenski, Peter Joseph, 4,055,701, Cl. 428-391.000.
Prakash, Sri, 4,055,850, Cl. 361-305.000.
Roberts, Rene, 4,055,549, Cl. 260-77.5AN.
Seese, Ray Bruce; and Watson, Bela Lee, 4,055,025, Cl. 51-411.000.

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Sharp, James E., 4,055,127, Cl. 112-143.000.

Uniroyal Aktiengesellschaft: *See—*
Senger, Gerhard Franz-Josef, 4,055,209, Cl. 152-209.00R.

United Aircraft Products, Inc.: *See—*
Freshcorn, Ivan Gene, 4,055,472, Cl. 204-32.00R.

United States of America
Agriculture: *See—*
Chance, Leon H.; and Timpa, Judy D., 4,055,720, Cl. 544-205.000.
Popper, Karel; Schultz, William G.; Camirand, Wayne M.; Hautala, Earl; Robertson, George H.; Crawford, Ladell; and Finkle, Bernard J., 4,055,675, Cl. 426-470.000.
Army: *See—*
Dudziak, Thaddeus J., 4,055,079, Cl. 73-117.300.
Wiese, Harold H.; and Wildman, James E., 4,055,105, Cl. 89-43.00R.
Energy Research and Development Administration: *See—*
Benedick, William B.; and Daniel, Charles J., 4,055,247, Cl. 206-3.000.
Herman, Richard Frederick, 4,055,199, Cl. 137-590.000.
Hudson, Ed D.; and Mallory, Merrit L., 4,055,782, Cl. 315-111.900.
Interior: *See—*
Durkin, John, 4,055,762, Cl. 250-253.000.
Finney, James Lee, 4,055,051, Cl. 61-45.00B.
Thimons, Edward D.; Vinson, Robert P.; Kissell, Fred N.; and Tall, Albert, 4,055,074, Cl. 73-40.000.
Wilson, Wallace C.; and Shoemaker, Ralph W., 4,055,830, Cl. 340-16.00R.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Holderman, Louis B.; and Peters, Palmer N. Germanium coated microbridge and method. 4,055,847, Cl. 357-5.000.
Sakellaris, Peter C. Automatic fluid dispenser. 4,055,147, Cl. 119-72.500.
Trowbridge, David L. Independent gain and bandwidth control of a traveling wave maser. 4,055,810, Cl. 330-4.000.
Updike, Otis L. Apparatus for measuring a sorbate dispersed in a fluid stream. 4,055,072, Cl. 73-23.000.
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Adamson, Arthur P.; Sargisson, Donald F.; and Stotler, Charles L., Jr., 4,055,041, Cl. 60-226.00R.
Black, James M., 4,055,777, Cl. 307-360.000.
Chase, Wendell D., 4,055,004, Cl. 35-12.00N.
Dimeff, John, 4,055,764, Cl. 250-336.000.
Jackson, Melvin R., 4,055,447, Cl. 148-32.000.
McDonald, Glen E., 4,055,707, Cl. 428-652.000.
Oldrieve, Robert E.; and Blankenship, Charles P., 4,055,416, Cl. 75-124.000.
Shriver, Edward L., 4,055,089, Cl. 73-432.00R.
Stecura, Stephan; and Leibert, Curt H., 4,055,705, Cl. 428-633.000.
Steinberg, Robert; Alger, Donald L.; and Cooper, Dale W., 4,055,686, Cl. 427-124.000.
Navy: *See—*
Hoffman, Robert T.; and Buecher, Roger W., 4,055,632, Cl. 423-657.000.
Means, Robert W., 4,055,776, Cl. 307-355.000.
Medford, Robert C., 4,055,709, Cl. 429-49.000.

U.S. Philips Corporation: *See—*
Kats, Mindert; and Sleumer, Hendrikus Bernardus, 4,055,114, Cl. 99-280.000.
Verhoeven, Robertus Jozefus Maria; and Ong, Daniel, 4,055,350, Cl. 274-10.00S.

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Carleton, Peter S.; Ewen, James H., Jr.; and Reymore, Harold E., Jr., 4,055,548, Cl. 260-77.5AT.
Nelson, Norman A., 4,055,602, Cl. 250-613.00D.
White, David R., 4,055,563, Cl. 542-413.000.

Urakawa, Akira: *See—*
Tanaka, Hiroshi; Ogisu, Noriyuki; and Urakawa, Akira, 4,055,235, Cl. 188-24.000.

Vaeth, Ernst: *See—*
Christophliemk, Peter; Friedemann, Wolfgang; Vaeth, Ernst; and Worms, Karl-Heinz, 4,055,622, Cl. 423-118.000.

Vajna, Eugenio: *See—*
Arrighetti, Sergio; Cesca, Sebastiano; Ghetti, Giuseppe; and Vajna, Eugenio, 4,055,535, Cl. 260-45.70R.

Valenti, Peter C.: *See—*
Barer, Sol J.; Valenti, Peter C.; and Marchwinski, Michael, 4,055,663, Cl. 424-319.000.

Valleylab: *See—*
Lundquist, Ingemar H., 4,055,176, Cl. 128-214.00C.

Valmet Oy: *See—*
Turunen, Risto, 4,055,461, Cl. 162-290.000.

Vamvakaris, Christos: *See—*
Patsch, Manfred; and Vamvakaris, Christos, 4,055,568, Cl. 260-302.00H.

Vandalen, Dirk J.: *See—*
Bayorgeon, Jeffrey T.; Vandalen, Dirk J.; and Legrand, Pierre N., 4,055,061, Cl. 72-32.000.

Vanderford, Wallace Snow, to Leeds & Northrup Company. Heater support element for electric furnace. 4,055,723, Cl. 13-25.000.

van der Lely, Cornelis. Soil cultivating implements. 4,055,221, Cl. 172-47.000.

Vandling, John M., to Exxon Research & Engineering Co. Apparatus for the direct connection of ancillary equipment to a telephone network. 4,055,729, Cl. 179-2.00C.

van Heel, Hubertus Johannes Gerardus, to Ultra-Centrifuge Nederland N.V. Apparatus for separating a sublimation product from a gas. 4,055,397, Cl. 23-264.000.

Van Horn, Albert R.: *See—*
Alvarez, Francisco S.; and Van Horn, Albert R., 4,055,564, Cl. 542-413.000.

Vanhumbeeck, Jacky: *See—*
Bussmann, Egon; Flamme, Bruno; Vanhumbeeck, Jacky; Helder, Johannes; and De Steur, Hubert, 4,055,751, Cl. 364-500.000.

van Riet, Jan A. P.: *See—*
Ziekman, Paul; and van Riet, Jan A. P., 4,055,382, Cl. 356-210.000.

van Staveren, Hendricus Cornelis: *See—*
Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,055,037, Cl. 56-16.400.

Van Vliet, Raymond August: *See—*
Ryan, Arthur Sensor; and Van Vliet, Raymond August, 4,055,183, Cl. 128-287.000.

Vasquez, Jose Arthur. Measured material delivery apparatus and method. 4,055,255, Cl. 214-2.000.

Veeder Industries, Inc.: *See*—
Marres, George; and D'Alesandris, Loreto B., 4,054,986, Cl. 29-434.000.

Veige, Sten: *See*—
Hogberg, Bertil; Fex, Hans; Perklev, Torsten; Veige, Sten; and Fredholm, Bo, 4,055,638, Cl. 424-219.000.

Velsicol Chemical Corporation: *See*—
Wu, Chin Ching; and Krenzer, John, 4,055,569, Cl. 260-305.000.

Vemco Products, Inc.: *See*—
Gatland, Geoffrey H.; and Robitaille, Kenneth L., 4,055,023, Cl. 49-28.000.

Verburg, Charles Cornelis: *See*—
Kattenberg, Hans Robert; and Verburg, Charles Cornelis, 4,055,679, Cl. 426-607.000.

Vereinigte Aluminum-Werke Aktiengese¶schaft: *See*—
Kampf, Fritz; and Kaltenberg, Hans-Georg, 4,055,218, Cl. 165-1.000.

Verhoeven. Robertus Jozefus Maria; and Ong, Daniel, to U.S. Philips Corporation. Changer pin for a record changer. 4,055,350, Cl. 274-10.00S.

Vernaleken, Hugo: *See*—
Hucks, Uwe; and Vernaleken, Hugo, 4,055,611, Cl. 264-6.000.

Vianova Kunstharz A.G.: *See*—
Daimer, Wolfgang, 4,055,517, Cl. 260-2.0EP.

Victor Company of Japan, Limited: *See*—
Watanabe, Yasuaki; Okabe, Yukio; Hayakawa, Mitsuru; Ikemura, Yuichi; Fujita, Yasuhiro; and Murakami, Daisuke, 4,055,817, Cl. 331-117.00R.

Vidalenq, Maurice. Gas boiler, particularly for central heating. 4,055,152, Cl. 122-235.00R.

Vig, Satinder K.; Koester, Harold J.; and Berg, William H., Jr., to American Sterilizer Company. Self aligning magnetic locking device for module swivel caster assembly. 4,054,965, Cl. 16-35.00D.

Vinals, Joaquin: *See*—
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,055,506, Cl. 252-132.000.

Vinson, Robert P.: *See*—
Thimons, Edward D.; Vinson, Robert P.; Kissell, Fred N.; and Tall, Albert, 4,055,074, Cl. 73-40.000.

Vock, Manfred Hugo: *See*—
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,055,691, Cl. 426-534.000.
Pittet, Alan Owen; Klaiber, Erich Manfred; Vock, Manfred Hugo; Shuster, Edward J.; and Vinals, Joaquin, 4,055,506, Cl. 252-132.000.

Vogel, Ralph A., to Essex Group, Inc. Control system and method for controlling the oxygen content in continuously cast metal. 4,055,212, Cl. 164-4.000.

Vogt, James E. Fishing tool. 4,054,969, Cl. 17-68.000.

Vonco Products, Inc.: *See*—
Laske, Louis Lawrence, 4,055,454, Cl. 156-290.000.

Voronkov, Mikhail Grigorievich; Platonova, Ada Timofeevna; Mansurova, Ljudmila Andreevna; Kuznetsov, Igor Georgievich; Zelchan, Gunar Izidorovich; and Dyakov, Valery Mikhailovich. Medicinal preparation for healing wounds and treating dermatites using 1-(chloromethyl)silatrane. 4,055,637, Cl. 424-184.000.

Voss, Charles J.; and Nykiel, Theodore, to Bell & Howell Company. Method of developing electrostatic images using wide latitude toner. 4,055,419, Cl. 96-1.0LY.

Vyvial, Larry A., to ACF Industries, Incorporated. Lubricant pocket for pressed in gate valve seat. 4,055,325, Cl. 251-328.000.

Wada, Shigetaka; and Atsumi, Senji, to NGK Insulators, Ltd. Barium titanate ceramic. 4,055,438, Cl. 106-73.320.

Wade, Betty Alma: *See*—
Lauer, John B.; and Wade, Betty Alma, 4,055,381, Cl. 355-75.000.

Wagers, Robert S.; and Hartmann, Clinton S., to Texas Instruments Incorporated. Acoustic ridge delay line. 4,055,819, Cl. 333-30.00R.

Wagers, Robert S.; and Hartmann, Clinton S., to Texas Instruments Incorporated. Acoustic ridge transversal filter. 4,055,821, Cl. 333-70.00T.

Wagner, Heinz: *See*—
Heumann, Heinz; Saure, Manfred; Wagner, Heinz; and Wartusch, Johann, 4,055,504, Cl. 252-63.200.

Wakasone, Masaharu: *See*—
Taga, Yasuyoshi; and Wakasone, Masaharu, 4,055,617, Cl. 264-141.000.

Waldenmeier, Gunter; and Hempelmann, Wilhelm, to Gesellschaft fur Kernforschung m.b.H. Dual lid for closing coupled openings. 4,055,274, Cl. 220-256.000.

Waldron, Stephen H., to American Sterilizer Company. Rotary drill for surgeons. 4,055,185, Cl. 128-305.100.

Walker, Gordon Marvin: *See*—
Lynn, William Fred; and Walker, Gordon Marvin, 4,055,369, Cl. 308-187.100.

Walker, Keith A. M., to Syntex (U.S.A.) Inc. 1-[β(R-thio)phenethyl-]imidazoles and derivatives thereof. 4,055,652, Cl. 424-273.00R.

Wallers, Richard A. Method for forming an underground cavity. 4,055,224, Cl. 175-5.000.

Wallshein, Melvin. Orthodontic appliance having replaceable tooth engaging member. 4,054,996, Cl. 32-14.00B.

Wallshein, Melvin. Orthodontic elastic appliance. 4,054,997, Cl. 32-14.00A.

Walter, Lothar: *See*—
Ernst, Horst Manfred; Olschewski, Armin; Schurger, Rainer; Walter, Lothar; Brandenstein, Manfred; and Burkl, Erich, 4,055,371, Cl. 308-201.000.

Walters, John P.; and Coleman, David M., to Wisconsin Alumni Research Foundation. Spark source with regulation of spark magnitude by control of spark timing. 4,055,783, Cl. 315-241.00R.

Wamac AB: *See*—
Sundberg, Leif, 4,055,245, Cl. 198-422.000.

Warner-Lehman Corporation: *See*—
Lehman, James Arlo, 4,055,193, Cl. 131-235.00R.

Wartusch, Johann: *See*—
Heumann, Heinz; Saure, Manfred; Wagner, Heinz; and Wartusch, Johann, 4,055,504, Cl. 252-63.200.

Wasson, Daniel A., to Ireco Chemicals. Aqueous blasting composition with crystal habit modifier. 4,055,449, Cl. 149-2.000.

Wat, Edward Koon Wah, to Du Pont de Nemours, E. I., and Company. Phenylureidoimidazolidinediones as plant protectants. 4,055,412, Cl. 71-92.000.

Watanabe, Tetsuya: *See*—
Saitoh, Shigeru; Watanabe, Tetsuya; Konno, Koji; and Nakamura, Tadashi, 4,055,623, Cl. 423-235.000.

Watanabe, Yasuaki; Okabe, Yukio; Hayakawa, Mitsuru; Ikemura, Yuichi; Fujita, Yasuhiro; and Murakami, Daisuke, to Matsushita Electric Industrial Company Limited; and Victor Company of Japan, Limited. Variable frequency oscillator. 4,055,817, Cl. 331-117.00R.

Watson, Bela Lee: *See*—
Seese, Ray Bruce; and Watson, Bela Lee, 4,055,025, Cl. 51-411.000.

Wavin B.V.: *See*—
Leloux, Arnoldus Willem Jan, 4,055,098, Cl. 83-309.000.

Weagle, James A., to Krueger Metal Products, Inc. Folding training table. 4,055,124, Cl. 108-132.000.

Wean United, Inc.: *See*—
Bartley, William W., 4,055,107, Cl. 92-86.500.

Weaver, Kenneth E.: *See*—
Goodenough, David John; Weaver, Kenneth E.; Smrcka, Joseph G.; and Clayman, William, 4,055,771, Cl. 250-505.000.

Weber, Jurgen: *See*—
Feichtinger, Hans; Payer, Wolfgang; Cornils, Boy; and Weber, Jurgen, 4,055,586, Cl. 260-465.50R.

Weber, Robert W., to Servco Company, a division of Smith International, Inc., The. Underreamer having splined torque transmitting connection between telescoping portions for control of cutter position. 4,055,226, Cl. 175-273.000.

Weed Eater, Inc.: *See*—
Ballas, George C.; and Geist, Thomas N., 4,054,992, Cl. 30-276.000.

Weimer, Dean R., to Continental Oil Company. Method for increasing the water dispersibility of alpha alumina monohydrate. 4,055,509, Cl. 252-363.500.

Weimer, Paul Kessler, to RCA Corporation. Charge transfer readout circuits. 4,055,836, Cl. 340-173.00R.

Weiner, Jay H., to Airway Industries, Inc. Luggage case. 4,055,239, Cl. 190-50.000.

Weinshenker, Ned M.; and Andersen, Niels H., to Alza Corporation. Alkyl diethers of prostaglandins. 4,055,593, Cl. 260-514.00D.

Weinshenker, Ned M., to Dynapol. Process for the reduction of aldehydes and ketones to the corresponding carbinols. 4,055,604, Cl. 260-618.00H.

Weisbrod, Alfred L. Lamp shade. 4,055,760, Cl. 362-352.000.

Wenger, George Michael: *See*—
Chu, Tze Yao; and Wenger, George Michael, 4,055,217, Cl. 165-1.000.

Wenner, Valentin: *See*—
Badertscher, Ernest; Chaveron, Michel; and Wenner, Valentin, 4,055,555, Cl. 260-119.000.

Werner, James L.: *See*—
Bauer, James J.; Albright, Larry E.; Werner, James L.; Sagaser, Thomas M.; and Hoechst, Lonnie D., 4,055,262, Cl. 214-140.000.

Wesner, Charles R., to Sperry Rand Corporation. Rudder error detector. 4,055,135, Cl. 114-144.00E.

Wessely, Eugene, to Gallay S.A. Method and apparatus for triple roll seaming end closures to container bodies. 4,055,133, Cl. 113-120.00Y.

Western Electric Company, Inc.: *See*—
Chu, Tze Yao; and Wenger, George Michael, 4,055,217, Cl. 165-1.000.
Keen, Ralph H.; and Seaman, Gary G., 4,055,616, Cl. 264-139.000.

Westvaco Corporation: *See*—
Hsu, Thomas C.; and Miller, John L., 4,055,462, Cl. 162-382.000.

Wetterhorn, Richard Harry, to Dresser Industries, Inc. Motion amplifier for condition responsive gauge instrument. 4,055,085, Cl. 73-418.000.

Weyerhaeuser Company: *See*—
Ryan, Arthur Sensor; and Van Vliet, Raymond August, 4,055,183, Cl. 128-287.000.

Whatman Reeve Angel Limited: *See*—
Strauss, Richard, 4,055,403, Cl. 55-31.000.

Wheatley, Carl Franklin, Jr., to RCA Corporation. Transistor amplifiers. 4,055,811, Cl. 330-289.000.

Wheeler, Ian Robert; and Robertson, George Heddle, to Ciba-Geigy Corporation. Pigment compositions. 4,055,440, Cl. 106-288.00Q.

Wheelock, Kenneth S., to Exxon Research & Engineering Co. Perovskite catalysts and process for their preparation. 4,055,513, Cl. 252-462.000.

Whetstone, Cecil, Jr.; and Burns, Anthony G., to Hossfeld Manufacturing Co. Method and apparatus for simultaneous edge bending of stair rail cap stock and channel stock. 4,055,065, Cl. 72-217.000.

Whitaker, Ranald O. Annunciator for use with electronic digital clock. 4,055,843, Cl. 340-384.00E:
White, David R., to Upjohn Company, The. Cyano intermediates for prostaglandins. 4,055,563, Cl. 542-413.000.
White, Lyall B. Method of broiling. 4,055,677, Cl. 426-438.000.
Widham, Ernest G. Toilet of compost type. 4,054,958, Cl. 4-144.000.
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Wiesel, Manfred; and Sommer, Richard, to Bayer Aktiengesellschaft. Sulfonamidobenzene-azo-aminopyrazole dyestuffs. 4,055,557, Cl. 260-162.000.
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Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,055,340, Cl. 271-236.000.
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CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976
B 66,272	4,014,978	Feb 24, 1976	Mar. 29, 1977
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 159,570	4,036,870	Mar. 23, 1976	July 19, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977
B 328,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
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B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977
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B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977
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B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar. 9, 1976	Nov. 2, 1976
B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 373,344	4,053,067	Feb. 3, 1976	Oct. 11, 1977
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
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B 396,164	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 396,377	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 397,674	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976
B 424,410	4,021,196	Mar. 30, 1976	May 3, 1977
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977
B 433,892	4,016,061	Apr. 6, 1976	Apr. 5, 1977
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977
B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977
B 461,752	4,016,541	Apr. 20, 1976	Apr. 5, 1977
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976
B 464,491	4,015,612	Mar. 30, 1976	Apr. 5, 1977
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976
B 467,412	3,981,265	Jan. 13, 1976	Sep. 21, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977
B 469,228	4,052,954	Feb. 17, 1976	Oct. 11, 1977
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976
B 471,681	4,012,844	Apr. 13, 1976	Mar. 22, 1977
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976
B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 478,759	4,055,681	Mar. 16, 1976	Oct. 25, 1977
B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 485,972	4,017,472	Mar. 23, 1976	Apr. 12, 1977
B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977
B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976	B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976
B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976	B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976
B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977	B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976
B 487,529	4,022,750	Mar. 30, 1976	May 10, 1977	B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976	B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976	B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976	B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976	B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976	B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976	B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977	B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977	B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976	B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976	B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976	B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977	B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976	B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976	B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976	B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976	B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976	B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976	B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976	B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976	B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976	B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976	B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976	B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976	B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977	B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976	B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976	B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 491,711	4,053,467	Mar. 23, 1976	Oct. 11, 1977	B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976	B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976	B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976	B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976	B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977	B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976	B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976	B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977	B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976	B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976	B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977	B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976	B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976	B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977	B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976	B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977	B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977	B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976	B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977	B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976	B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976	B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 494,138	4,034,002	Mar. 23, 1976	July 5, 1977	B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976	B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977	B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976	B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976	B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976	B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976	B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976	B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976	B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976	B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976	B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976	B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976	B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976	B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976	B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976	B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977	B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976	B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976	B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976	B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976	B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976	B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976	B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976	B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976	B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976	B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976	B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976	B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976	B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977	B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976	B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977	B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977
B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976
B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977
B 510,026	4,016,763	Apr. 13, 1976	Apr. 12, 1977
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976
B 514,839	4,033,816	Mar. 2, 1976	July 5, 1977
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976
B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976
B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977
B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976	B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976	B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976	B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976	B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976	B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977	B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976	B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976	B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977	B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977	B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977	B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977	B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976	B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977	B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976	B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976	B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976	B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976	B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976	B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976	B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976	B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976	B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976	B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977	B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976	B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976	B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976	B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976	B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977	B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977	B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976	B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976	B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977	B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976	B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976	B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976	B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976	B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976	B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976	B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976	B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976	B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976	B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976	B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976	B 561,784	3,934,710	Jan. 27, 1976	Oct. 5, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976	B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976	B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976	B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976	B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976	B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976	B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976	B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976	B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976	B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976	B 564,255	4,015,996	Mar. 30, 1976	Apr. 5, 1977
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977	B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976	B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976	B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976	B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976	B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976	B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977	B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976	B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977	B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976	B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977	B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 554,164	4,001,465	Mar 9, 1976	Jan. 4, 1977	B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976	B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977	B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977	B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976	B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977	B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977	B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976	B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977	B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976	B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976	B 570,925	4,040,802	Mar. 23, 1976	Aug. 9, 1977
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976	B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976	B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976	B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976	B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977	B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976	B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976	B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977	B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976	B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976	B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976	B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976	B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976	B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976	B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976	B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976	B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977	B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 559,394	4,016,09-	Apr. 20, 1976	Apr. 5, 1977	B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 559,441	4,013,60-	Mar. 23, 1976	Mar. 22, 1977	B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977	B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976	B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977	B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977	B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976	B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976	B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976	B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976	B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976	B 581,564	4,036,653	Mar. 23, 1976	July 19, 1977
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976	B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976	B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977	B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977	B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977	B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976	B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977	B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976	B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976	B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976	B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976	B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976	B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976	B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976	B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF OCTOBER, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ashmead, Howard L.; Byrne, Sydnor H., Jr.; and Wolf, John P., III, to Du Pont de Nemours, E. I., and Company. Method for producing a gradient elution. Re. 29,454, Cl. 222-1.000.

Berman, George A.: *See*—
Drutchas, Gilbert H.; and Berman, George A., Re. 29,456, Cl. 417-53.000.

Brodbeck, John J., to Chevron Research Company. Equilibration of lower alkyl substituted polyalkyl aromatic hydrocarbons with reduced disproportionation. Re. 29,459, Cl. 260-668.00A.

Byrne, Sydnor H., Jr.: *See*—
Ashmead, Howard L.; Byrne, Sydnor H., Jr.; and Wolf, John P., III, Re. 29,454, Cl. 222-1.000.

Chevron Research Company: *See*—
Brodbeck, John J., Re. 29,459, Cl. 260-668.00A.

Coleman Company, Inc., The: *See*—
Hastings, Thomas C., Re. 29,457, Cl. 431-123.000.

Drechsel, Erhart K.; Sardisco, John B.; and Stewart, James R., Jr., to Pennzoil Company. Potassium phosphate manufacture. Re. 29,458, Cl. 71-34.000.

Drutchas, Gilbert H.; and Berman, George A., to TRW Inc. Pumps with servo-type actuation for cheek plate unloading. Re. 29,456, Cl. 417-53.000.

Du Pont de Nemours, E. I., and Company: *See*—
Ashmead, Howard L.; Byrne, Sydnor H., Jr.; and Wolf, John P., III, Re. 29,454, Cl. 222-1.000.

GTE Automatic Electric Laboratories Incorporated: *See*—
Mills, Jeffrey P., Re. 29,460, Cl. 364-724.000.

Hastings, Thomas C., to Coleman Company, Inc., The. Fuel control means for burners. Re. 29,457, Cl. 431-123.000.

Marsan Manufacturing Company, Inc.: *See*—
Weddle, Rosemary B., Re. 29,453, Cl. 128-283.000.

Mills, Jeffrey P., to GTE Automatic Electric Laboratories Incorporated. PCM tone receiver using optimum statistical technique. Re. 29,460, Cl. 364-724.000.

Mita, Yoshinari: *See*—
Moriwaki, Masahiro; Sakaguchi, Mitsuhito; and Mita, Yoshinari, Re. 29,461, Cl. 340-173.0LM.

Moriwaki, Masahiro; Sakaguchi, Mitsuhito; and Mita, Yoshinari, to Nippon Electric Company, Limited. Hologram graphic data tablet apparatus using a vernier. Re. 29,461, Cl. 340-173.0LM.

Nippon Electric Company, Limited: *See*—
Moriwaki, Masahiro; Sakaguchi, Mitsuhito; and Mita, Yoshinari, Re. 29,461, Cl. 340-173.0LM.

Pennzoil Company: *See*—
Drechsel, Erhart K.; Sardisco, John B.; and Stewart, James R., Jr., Re. 29,458, Cl. 71-34.000.

Sakaguchi, Mitsuhito: *See*—
Moriwaki, Masahiro; Sakaguchi, Mitsuhito; and Mita, Yoshinari, Re. 29,461, Cl. 340-173.0LM.

Sardisco, John B.: *See*—
Drechsel, Erhart K.; Sardisco, John B.; and Stewart, James R., Jr., Re. 29,458, Cl. 71-34.000.

Slayton, Dale E.: *See*—
Slayton, Darrell E., Re. 29,455, Cl. 280-106.00T.

Slayton, Darrell E., to Slayton, Dale E. Hay baler trailer. Re. 29,455, Cl. 280-106.00T.

Stewart, James R., Jr.: *See*—
Drechsel, Erhart K.; Sardisco, John B.; and Stewart, James R., Jr., Re. 29,458, Cl. 71-34.000.

Townsend, Charles E., Jr. Headwear construction. Re. 29,452, Cl. 2-177.000.

TRW Inc.: *See*—
Drutchas, Gilbert H.; and Berman, George A., Re. 29,456, Cl. 417-53.000.

Weddle, Rosemary B., to Marsan Manufacturing Company, Inc. Drainage bag for human body. Re. 29,453, Cl. 128-283.000.

Wolf, John P., III: *See*—
Ashmead, Howard L.; Byrne, Sydnor H., Jr.; and Wolf, John P., III, Re. 29,454, Cl. 222-1.000.

LIST OF PLANT PATENTEES

Genn, Fern F.: *See*—
Genn, Olan R., 4,132, Cl. 32.000.

Genn, Olan R., to Genn, Olan R.; and Genn, Fern F. Walnut tree. 4,132, 10-25-77, Cl. 32.000.

Kashima, Takaaki Peter. Chrysanthemum named Imperial Yellow. 4,137, 10-25-77, Cl. 78.000.

Kepitis, Elga, by said Juris E. Schutz: *See*—
Schutz, Juris Edgar; and McIntosh, Murdoch Niall, 4,136, Cl. 54.000.

Kepitis, Peteris: *See*—
Schutz, Juris Edgar; and McIntosh, Murdoch Niall, 4,136, Cl. 54.000.

McIntosh, Murdoch Niall: *See*—
Schutz, Juris Edgar; and McIntosh, Murdoch Niall, 4,136, Cl. 54.000.

Mock, Norman. Chrysanthemum. 4,133, 10-25-77, Cl. 74.000.

Mock, Norman. Chrysanthemum. 4,134, 10-25-77, Cl. 74.000.

Mock, Norman. Chrysanthemum. 4,135, 10-25-77, Cl. 74.000.

Schutz, Juris E., by said Murdoch N. McIntosh: *See*—
Schutz, Juris Edgar; and McIntosh, Murdoch Niall, 4,136, Cl. 54.000.

Schutz, Juris Edgar; and McIntosh, Murdoch Niall, to Schutz, Juris E., by said Murdoch N. McIntosh; Schutz, Solveiga M.; Kepitis, Peteris; and Kepitis, Elga, by said Juris E. Schutz, part interest to each. *Coleonema pulchrum* plant. 4,136, 10-25-77, Cl. 54.000.

Schutz, Solveiga M.: *See*—
Schutz, Juris Edgar; and McIntosh, Murdoch Niall, 4,136, Cl. 54.000.

LIST OF DESIGN PATENTEES

AB Bofors: *See*—
Dahlberg, Sten Johan; Korpi, Jouko Kalevi; and Larsson, Ulf Robert, 246,176, Cl. D15-32.000.

Akers, Scott P. Aquarium cover. 246,194, 10-25-77, Cl. D30-12.000.

Albright, Harold D., Jr. Building for dispensing ice cream. 246,192, 10-25-77, Cl. D25-9.000.

AMF Incorporated: *See*—
Podall, Robert, 246,159, Cl. D10-40.000.

Bacskay, Stephen A.; and Messeri, Sidney, to Outlook in Plastics Corporation, Inc.; and Tingue, Brown & Co., part interest to each. Cart. 246,165, 10-25-77, Cl. D12-29.000.

Balmer, James G.; and Linder, Peter E., to Velo-Bind, Inc. Book binding machine. 246,204, 10-25-77, Cl. D64-11.00R.

Bausch & Lomb Incorporated: *See*—
Jordan, Paul A., 246,188, Cl. D24-17.000.

Beatrice Foods Co.: *See*—
Lindner, Henry, 246,161, Cl. D10-111.000.
Lindner, Henry, 246,162, Cl. D10-111.000.
Lindner, Henry, 246,163, Cl. D10-111.000.

Benkoe, Erwin: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 246,195, Cl. D34-4.00R.

Bradburne, Francis Edward Husband. Air freshener or the like. 246,185, 10-25-77, Cl. D23-150.000.

Bulova Watch Company, Inc.: *See*—
Koehler, Dale R., 246,164, Cl. D10-124.000.

Butsch, Otto R., to Sycor, Inc. Closure and bezel for disk recorders and the like. 246,178, 10-25-77, Cl. D14-40.000.

Campagnolo, Tullio. Wheel for motor-cycles. 246,172, 10-25-77, Cl. D12-205.000.

Carlsson, Stig Ture; Scuka, Viktor; and Rasmusson, Bo Magnus, to Telefonaktiebolaget L M Ericsson. Tool for digging and laying of submarine cable. 246,167, 10-25-77, Cl. D12-65.000.

Chan, Ming Kong. Portable cooking stove. 246,151, 10-25-77, Cl. D7-110.000.

Chesebrough-Pond's Inc.: *See*—
Russo, John A.; Ham, David E.; and Vitrac, Jean Pierre, 246,191, Cl. D24-33.000.

Chesley, Ronald F.: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 246,195, Cl. D34-4.00R.

Codi Corporation: *See*—
Kudla, John, 246,184, Cl. D23-127.000.

Dahlberg, Sten Johan; Korpi, Jouko Kalevi; and Larsson, Ulf Robert, to AB Bofors. Adapter for corner shaped tooth for excavating, digging or bucket loading equipment. 246,176, 10-25-77, Cl. D15-32.000.

Dalziel, Warren L., to Shugart Associates. Disk clamping element. 246,177, 10-25-77, Cl. D14-40.000.

DeArment, Samuel W. Double syringe. 246,187, 10-25-77, Cl. D24-14.000.

Dodd, Jackie L. Bicycle. 246,171, 10-25-77, Cl. D12-111.000.

Durco, Andrew, Jr., to Mostek Corporation. Digital clock. 246,158, 10-25-77, Cl. D10-15.000.

Evangelista, Bisked U. Citrus fruit juice extractor. 246,150, 10-25-77, Cl. D7-48.000.

Everitt, Delmar K.: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 246,195, Cl. D34-4.00R.

Faivre, Andre, to S E B. Electric ice-cream freezer. 246,179, 10-25-77, Cl. D15-82.000.

Frierdich, Richard D.: *See*—
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 246,195, Cl. D34-4.00R.

Gillette Company, The: *See*—
Muscatiello, Ralph A.; and Wright, Kent M., 246,156, Cl. D9-71.000.

Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., to Goldfarb, Adolph E.; and Benkoe, Erwin. Boy doll. 246,195, 10-25-77, Cl. D34-4.00R.

Griffin, Timothy L., Jr. Speaker enclosures. 246,174, 10-25-77, Cl. D14-33.000.

Ham, David E.: *See*—
Russo, John A.; Ham, David E.; and Vitrac, Jean Pierre, 246,191, Cl. D24-33.000.

Han, Robert K. S. Chest of drawers. 246,146, 10-25-77, Cl. D6-145.000.

Harris, Edward H. Lighting panel. 246,203, 10-25-77, Cl. D48-23.00R.

Hendricks, Lee. Hanging support for articles. 246,145, 10-25-77, Cl. D6-113.000.

Heumann, Jules M., to Metropolitan Furniture Manufacturing Company. Bench or similar article. 246,142, 10-25-77, Cl. D6-58.000.

Hodge, Joseph, to Pilling Co. Hepatic occlusion clamp. 246,190, 10-25-77, Cl. D24-27.000.

Hoyt, Earl. Squeeze bottle or the like. 246,155, 10-25-77, Cl. D9-2.000.

Insalaco, Charles J. Contoured grading rake. 246,153, 10-25-77, Cl. D8-13.000.

Iwanami, Tetsuo, to Sanyei Corporation. Stylized boxing game apparatus, or similar article. 246,197, 10-25-77, Cl. D34-15.0AD.

Jordan, Paul A., to Bausch & Lomb Incorporated. Ophthalmometer or similar article. 246,188, 10-25-77, Cl. D24-17.000.

Keen, Robert Donald. Sprinkler standard. 246,183, 10-25-77, Cl. D23-7.000.

Kocour, Max G.; and Zundel, Arthur P., to National Can Corporation. End closure for a container. 246,157, 10-25-77, Cl. D9-255.000.

Koehler, Dale R., to Bulova Watch Company, Inc. Electronic watch. 246,164, 10-25-77, Cl. D10-124.000.

Korpi, Jouko Kalevi: *See*—
Dahlberg, Sten Johan; Korpi, Jouko Kalevi; and Larsson, Ulf Robert, 246,176, Cl. D15-32.000.

Kudla, John, to Codi Corporation. Boat for carrying articles into and out of furnaces. 246,184, 10-25-77, Cl. D23-127.000.

Kusek, Edwin F., to Wesley-Jessen Inc. Dispensing rack for contact lens vials. 246,148, 10-25-77, Cl. D6-188.000.

Landrus, Donald S. Man powered airplane. 246,168, 10-25-77, Cl. D12-78.000.

Larsson, Ulf Robert: *See*—
Dahlberg, Sten Johan; Korpi, Jouko Kalevi; and Larsson, Ulf Robert, 246,176, Cl. D15-32.000.

Lattie, Robert A. Reflector. 246,160, 10-25-77, Cl. D10-111.000.

Levin, Kenneth M. Control unit for electronic neural stimulator. 246,173, 10-25-77, Cl. D13-32.000.

Levin, Monte L., to Scovill Manufacturing Company. Electric food cooker. 246,149, 10-25-77, Cl. D7-94.000.

Lewis, Peter Howard. Combined wallet and calculator. 246,205, 10-25-77, Cl. D87-3.00A.

Linder, Peter E.: *See*—
Balmer, James G.; and Linder, Peter E., 246,204, Cl. D64-11.00R.

Lindner, Henry, to Beatrice Foods Co. Reflector. 246,161, 10-25-77, Cl. D10-111.000.

Lindner, Henry, to Beatrice Foods Co. Reflector. 246,162, 10-25-77, Cl. D10-111.000.

Lindner, Henry, to Beatrice Foods Co. Reflector. 246,163, 10-25-77, Cl. D10-111.000.

Luoma, Emil Thomas. Anchoring device for plants. 246,152, 10-25-77, Cl. D8-1.000.

Mazur, Harry E. Fastener. 246,141, 10-25-77, Cl. D2-409.000.

Meek, Robert P. Boat hull. 246,166, 10-25-77, Cl. D12-62.000.

Messeri, Sidney: *See*—
Bacskay, Stephen A.; and Messeri, Sidney, 246,165, Cl. D12-29.000.

Metropolitan Furniture Manufacturing Company: *See*—
Heumann, Jules M., 246,142, Cl. D6-58.000.

Mostek Corporation: *See*—
Durco, Andrew, Jr., 246,158, Cl. D10-15.000.

Muller, Walter. Combined multiple cabinet and shelf storage unit. 246,147, 10-25-77, Cl. D6-164.000.

Muscatiello, Ralph A.; and Wright, Kent M., to Gillette Company, The. Combined bottle and cap therefor. 246,156, 10-25-77, Cl. D9-71.000.

Nash, Stanley P., to Schweiger Industries, Inc. Seat. 246,143, 10-25-77, Cl. D6-63.000.

Nash, Stanley P., to Schweiger Industries, Inc. Seat. 246,144, 10-25-77, Cl. D6-63.000.

National Can Corporation: *See*—
Kocour, Max G.; and Zundel, Arthur P., 246,157, Cl. D9-255.000.

Neary, Joseph F., to Troller Corporation. Diving sinker. 246,182, 10-25-77, Cl. D22-30.000.

Ogawa, Iwakichi, to Takara Co., Ltd. Articulated toy figure. 246,199, 10-25-77, Cl. D34-15.0AD.

Ogawa, Iwakichi, to Takara Co., Ltd. Articulated toy figure. 246,200, 10-25-77, Cl. D34-15.0AD.

Ogawa, Iwakichi, to Takara Co., Ltd. Articulated toy figure. 246,201, 10-25-77, Cl. D34-15.0AD.

Oppermann, Henry J. Animation lamp. 246,202, 10-25-77, Cl. D48-20.00R.

Outlook in Plastics Corporation, Inc.: *See*—
Bacskay, Stephen A.; and Messeri, Sidney, 246,165, Cl. D12-29.000.

Pilling Co.: *See*—
Hodge, Joseph, 246,190, Cl. D24-27.000.

Podall, Robert, to AMF Incorporated. Lighting and appliance timer. 246,159, 10-25-77, Cl. D10-40.000.

Powers, Michael E. Bicycle cowling. 246,170, 10-25-77, Cl. D12-111.000.

Rasmusson, Bo Magnus: *See*—
Carlsson, Stig Ture; Scuka, Viktor; and Rasmusson, Bo Magnus, 246,167, Cl. D12-65.000.

Reckwald, Sandra Lee. Building. 246,193, 10-25-77, Cl. D25-24.000.

Rorabaugh, Dale A., to Surgical Mechanical Research, Inc. Ophthalmic support stand. 246,186, 10-25-77, Cl. D24-1.100.

Rose, Douglas H. Coaster. 246,198, 10-25-77, Cl. D34-15.0AJ.

Russo, John A.; Ham, David E.; and Vitrac, Jean Pierre, to Chesebrough-Pond's Inc. Swab dispenser. 246,191, 10-25-77, Cl. D24-33.000.

S E B: *See*—
Faivre, Andre, 246,179, Cl. D15-82.000.

Sanyei Corporation: *See*—
Iwanami, Tetsuo, 246,197, Cl. D34-15.0AD.

Schweiger Industries, Inc.: *See*—
Nash, Stanley P., 246,143, Cl. D6-63.000.
Nash, Stanley P., 246,144, Cl. D6-63.000.

Scovill Manufacturing Company: *See*—
Levin, Monte L., 246,149, Cl. D7-94.000.

Scuka, Viktor: *See*—
Carlsson, Stig Ture; Scuka, Viktor; and Rasmusson, Bo Magnus, 246,167, Cl. D12-65.000.

Shugart Associates: *See*—
Dalziel, Warren L., 246,177, Cl. D14-40.000.

Smith, Harold E. Electroauricular therapy probe. 246,189, 10-25-77, Cl. D24-17.000.

Spencer, Gary. Vending vehicle body for selling and dispensing frozen deserts or the like. 246,169, 10-25-77, Cl. D12-99.000.

Stubelick, Gary Adam. Headphone apparatus. 246,175, 10-25-77, Cl. D14-36.000.

Surgical Mechanical Research, Inc.: *See*—
Rorabaugh, Dale A., 246,186, Cl. D24-1.100.

Suzuki, Toshio, to Tomy Kogyo Co., Inc. Toy racing trackway. 246,196, 10-25-77, Cl. D34-5.0CC.

Sweeney, Thomas E. Fishing rod handle. 246,181, 10-25-77, Cl. D22-23.000.

Sycor, Inc.: *See*—
Butsch, Otto R., 246,178, Cl. D14-40.000.

Takara Co., Ltd.: *See*—
Ogawa, Iwakichi, 246,199, Cl. D34-15.0AD.
Ogawa, Iwakichi, 246,200, Cl. D34-15.0AD.
Ogawa, Iwakichi, 246,201, Cl. D34-15.0AD.

Telefonaktiebolaget L M Ericsson: *See*—
Carlsson, Stig Ture; Scuka, Viktor; and Rasmusson, Bo Magnus, 246,167, Cl. D12-65.000.

Tingue, Brown & Co.: *See*—
Bacskay, Stephen A.; and Messeri, Sidney, 246,165, Cl. D12-29.000.

Tomy Kogyo Co., Inc.: *See*—
Suzuki, Toshio, 246,196, Cl. D34-5.0CC.

Troller Corporation: *See*—
Neary, Joseph F., 246,182, Cl. D22-30.000.

Tsang, Chak-Pui. Combined letter opener and key holder. 246,154, 10-25-77, Cl. D8-104.000.
Velo-Bind, Inc.: *See*—
Balmer, James G.; and Linder, Peter E., 246,204, Cl. D64-11.00R.
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Russo, John A.; Ham, David E.; and Vitrac, Jean Pierre, 246,191, Cl. D24-33.000.
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Kusek, Edwin F., 246,148, Cl. D6-188.000.
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NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

177 Re.29,452
338 4,054,952
414 4,054,953

CLASS 3

1 4,054,954
1.91 4,054,955

CLASS 4

110 4,054,957
144 4,054,958

CLASS 5

9 R 4,054,956
81 R 4,054,959
357 4,054,960

CLASS 8

21 C 4,055,392
62 4,055,393

CLASS 9

11 A 4,054,961

CLASS 13

16 4,055,722
25 4,055,723

CLASS 15

105 4,054,962
310 4,054,963

CLASS 16

20 4,054,964
35 D 4,054,965
143 4,054,966

CLASS 17

32 4,054,967
44.2 4,054,968
68 4,054,969
71 4,054,970

CLASS 23

230 EP 4,055,399
253 R 4,055,395
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259 4,055,396
264 4,055,397
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277 C 4,055,401

CLASS 24

68 CD 4,054,971
201 HE 4,054,972
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CLASS 26

9 4,054,974

CLASS 29

27 C 4,054,975
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157.1 R 4,054,978
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157.3 R 4,054,980
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159.1 4,054,982
227 4,054,983
237 4,054,984
416 4,054,985
434 4,054,986
452 4,054,987
564.6 4,054,988
571 4,054,989
623.1 4,054,990

CLASS 30

231 4,054,991
276 4,054,992
4,054,993
296 R 4,054,994

CLASS 32

11 4,054,995
14 A 4,054,997
14 B 4,054,996
33 4,054,998

CLASS 33

181 AT 4,054,999
241 4,055,000

CLASS 34

1 4,055,001
104 4,055,002
155 4,055,003

CLASS 35

12 N 4,055,004

CLASS 36

135 4,055,005

CLASS 37

69 4,055,006
126 AE 4,055,007

CLASS 40

104.19 4,055,008
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124 4,055,010
124.1 4,055,011
129 C 4,055,012
4,055,013
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CLASS 42

1 R 4,055,015
71 R 4,055,016
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CLASS 43

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CLASS 44

1 R 4,055,400
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CLASS 46

30 4,055,019
161 4,055,020
202 4,055,021

CLASS 47

79 4,055,022

CLASS 49

28 4,055,023
153 4,055,024

CLASS 51

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238 GG 4,055,027
334 4,055,028
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CLASS 52

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CLASS 53

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122 4,055,033
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CLASS 55

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216 4,055,405

CLASS 56

13.6 4,055,036
16.4 4,055,037

CLASS 57

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34 AT 4,055,039
140 BY 4,055,040

CLASS 60

226 R 4,055,041
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265 4,055,044
282 4,055,043
322 4,055,045
428 4,055,046
444 4,055,047
646 4,055,048
651 4,055,049
692 4,055,050

CLASS 61

45 B 4,055,051
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CLASS 62

3 4,055,053
114 4,055,054
238 4,055,055
324 4,055,056

CLASS 63

7 4,055,057

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CLASS 66

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CLASS 70

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90 4,055,410
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97 4,055,413
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47 4,055,062
62 4,055,063
118 4,055,064
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306 4,055,066
328 4,055,067
356 4,055,068
389 4,055,069
461 4,055,070
467 4,055,073

CLASS 73

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23 4,055,072
40 4,055,074
40.7 4,055,075
61.4 4,055,076
73 4,055,077
88.5 R 4,055,078
117.3 4,055,079
139 4,055,080
146 4,055,081
194 E 4,055,083
194 R 4,055,082
249 4,055,084
418 4,055,085
421 R 4,055,087
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510 4,055,090

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439 4,055,092
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50 4,055,434
52 4,055,435
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73.32 4,055,438
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CLASS 110

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624.11 4,055,200

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CLASS 148

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51 R 4,055,737
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315 4,055,739

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CLASS 209

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74 M 4,055,252
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119 4,055,499
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6 DK 4,055,256
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70 4,055,280
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CLASS 226

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CLASS 228

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CLASS 229

17 M 4,055,292
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69 4,055,294
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CLASS 235

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CLASS 236

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CLASS 237

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CLASS 239

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102 4,055,302
142 4,055,303
230 4,055,304
524 4,055,305
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CLASS 241

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100 4,055,308
221 4,055,309

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7.08 4,055,310
18 DD 4,055,311
43.1 4,055,312
56.4 4,055,313
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CLASS 250

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2.5 AK 4,055,519
2.5 AM 4,055,518
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23.7 A 4,055,527
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37 EP 4,055,533
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45.8 N 4,055,536
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47 CP 4,055,543
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47 P 4,055,545
47 UA 4,055,542
47 XA 4,055,544
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67 FP 4,055,547
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77.5 AT 4,055,548
78 L 4,055,552
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250 AH 4,055,644
281 N 4,055,565
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302 H 4,055,568
305 4,055,569
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593 R 4,055,601
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624 R 4,055,605
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105 4,055,615
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141 4,055,617
4,055,618
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CLASS 271

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CLASS 273

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CLASS 282

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